Department of Health
and the Welsh Office

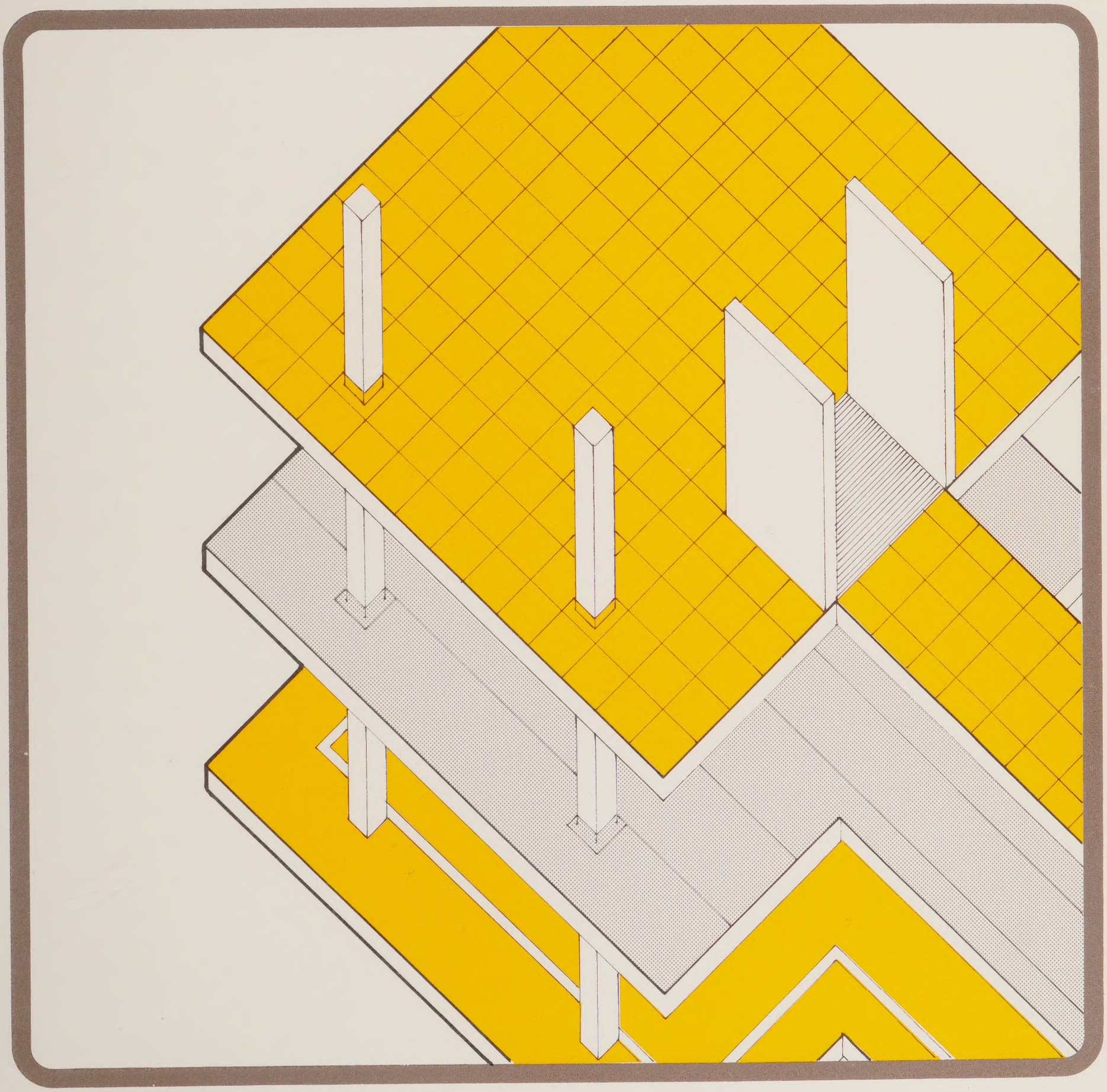
MC0015

Health Technical Memorandum

Building components

Flooring

61



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1 Introduction

1.1 Background

This is one of a series of *Health Technical Memoranda* which provide specification and design guidance on building components for health buildings which are not adequately covered by current British Standards.

The series supersedes all Component Data Base Mk 3 (and earlier Manufacturers Data Base) information.

The numbers and titles of the HTM in the series are:

54 Building components and user manual
55 Windows
56 Partitions
57 Internal glazing
58 Internal doorsets
59 Ironmongery
60 Ceilings
61 Flooring
62 Demountable storage system
63 Fitted storage system
64 Sanitary assemblies
65 Signs
66 Cubicle curtain track
67 Laboratory fitting out systems
68 Duct and panel assemblies
69 Protection
70 Fixings

The technical information in this series is the result of research and development funded by the Department as part of collaborative working arrangements over a number of years between the Department, the NHS, and Industry through the medium of the Component Data Base.

Any enquiries regarding the technical content of this HTM should be directed to Health Building Directorate, Department of Health, Euston Tower, 286 Euston Road, London NW1 3DN.

1.2 General considerations

The provision of flooring which will meet user requirements and the conditions of use in health buildings will depend upon the co-ordination of information and decisions taken at all the following stages:

- design brief
- design and specification
- production documentation
- procurement
- construction
- commissioning
- cleaning and maintenance.

1.3 Scope and status

This HTM offers guidance on all these stages, or refers to other authoritative sources of information.

Its content does not diminish either manufacturer responsibility for fitness for purpose of products, or design team responsibility for selection and application of products to meet project requirements.

1.4 Application

Because of the wide ranging considerations necessary to successful selection, specification, installation, and use of flooring, this HTM should be made available to project teams, design teams and those responsible for construction, commissioning and maintenance of health buildings.

It is mainly concerned with new building work but much of the information it contains is equally applicable to renewal of flooring in existing buildings.

1.5 Relationship to other data

The main sources of data used in the preparation of this HTM are listed in the References section.

This HTM was prepared in May 1985 and revised in May 1988, and is based on data current at that date. Readers should ensure that they use the latest edition of all building legislation, British Standards, etc., and give first preference to products and services from sources which have been Registered under BSI Quality Assurance procedures or other certification scheme.

Suppliers offering products other than to British Standards should provide evidence to show that their products are at least equal to such Standards.

Sections of the National Building Specification relevant to flooring are listed in Appendix B.

1.6 Terminology

The following terms are used throughout this HTM. Others are defined in the sections in which they are used:

Flooring system – the combination of one or more of the following:

- underlay – material laid on or applied to a base or screed to render it suitable to accept the selected finish
- screed – a layer of material usually comprising a mixture of cement and sand laid over the base and brought to a suitable surface to receive the finish
- bed – a layer of cement and sand to enable rigid tiles and slabs to be levelled and fixed in position
- finish – the uppermost layer
- accessories – skirtings, stair treads etc.

Base – the structure upon which the flooring system is laid.

Separating layer – a layer of material isolating the base from the screed or bed.

Damp-proof membrane – a continuous layer of impervious material to resist the passage of moisture and moisture vapour.

2 User requirements

2.1 Categories of performance of finishes

Six categories of performance have been established as a means of relating user requirements for floor finishes to the physical and performance characteristics of floor finishes available on the market. These categories are used as a convenient method of stating user requirements on the schedule of activity spaces (see Appendix A of this HTM) and in the Activity Data Base.

Physical and performance characteristics	Categories of performance of finishes					
	1 hard finish	2 hard finish	3 hard finish	4 hard finish	5 hard finish	6 soft finish
Impervious	●	●	●	●	●	★(1)
Jointless	●	●	●	●		●
Smooth	●	●	●		●	
Anti-static (2)	●					
Extra slip resistant				●		
Low liquid absorption						●
Low radius of ignition						●
Low dirt retention						●
Patterned						●
Cleaning routine A	●					
Cleaning routine B		●		●		
Cleaning routine C			●		●	
Cleaning routine D			●		●	
Cleaning routine E						●

The above categories do not include any special user requirements such as sound absorption, resistance to chemicals, etc.

(1) Soft finishes need to be impervious only in the activity spaces listed in Appendix A which are marked with an asterisk to indicate that wet spillage is likely.

(2) All category 1 finishes should be hard wearing and durable, anti-static properties are at the discretion of the project team.

2.2 Physical and performance characteristics

2.2.1 Hard finishes

A hard finish is a homogeneous material formed from one or more of the following:

- thermoplastics
- natural stone
- clay
- sand
- cement
- thermosetting resins.

The physical and performance characteristics of hard finishes may be defined as:

- impervious – able to resist the penetration of liquids
- jointless – without joints or having joints which are sealed by materials and methods which make the whole surface impervious and prevents the collection of dirt and bacteria in the joint
- smooth – smooth to the touch, without pronounced texturing of the face exposed to traffic
- anti-static – when installed meets the requirements set out in the current edition of Health Technical Memorandum No 2
- extra slip resistant – has a coefficient of friction when wet of not less than 0.4 and graded 'good' as referred to in Table 3 of BS 5395 (see Appendix C).

Indicative cleaning routines for hard finishes

	Daily	Weekly	Periodically
A	Wet scrub		
B	Wet soap with hot water and neutral detergent (dis-infectant may be required in some areas)		
C	Damp mop and spot clean	Damp mop with dressing/water solution and burnish	Machine strip using hot water and alkaline detergent - rinse to neutral - re -apply dressing and burnish between coats. In extreme cases at 6 weekly intervals, less frequently in others
D	Damp mop up to 3 times per day	Damp mop with dressing/water solution, burnish and spray clean	As for C In extreme cases at 4 weekly intervals, less frequent in others

2.2.2 Soft finishes

A soft finish is a textile material, woven, stitched or otherwise formed from natural or man made fibres or both.

The physical and performance characteristics of soft finishes may be defined as:

- impervious – constructed with an impervious backing to resist the passage of liquids.
- low liquid absorption – does not readily absorb liquids
- low radius of ignition – the determination of flammability as defined in BS 5287 when tested in accordance with BS 4790 (the hot metal nut method)
- low dirt retention – has a pile that is cut or otherwise formed so that it does not easily retain dirt
- jointless – without joints, or with minimum jointing.

Indicative cleaning routines for soft finishes

	Daily	Periodically
E	Suction cleaning and spot cleaning as required	Hot water extraction cleaning

2.3 Finishes related to groups and categories

The table below groups floor finishes according to their performance and physical characteristics. Each group is related to one or more of the six categories of performance set out in 2.1.

Ref	Group	Finish	Category					
			1	2	3	4	5	6
AS	Anti-static	AS: pvc sheet: welded joints AS: pvc tiles: welded joints AS: terrazzo tiles: cement based AS: in-situ terrazzo: cement based AS: resin based	● ● ● ● ●					
S	Sheet	pvc pvc resilient backed linoleum					● ● ●	
SW	Sheet: welded joints	pvc pvc resilient backed linoleum	○ ○ ○	● ● ●	● ● ●			
TF	Tile: flexible	pvc semi-flexible pvc linoleum					● ● ●	
TREJ	Tile: rigid epoxy joints	ceramic terrazzo: cement based	○ ○	● ●				
TRCJ	Tile: rigid cement joints	ceramic terrazzo: cement based clay floor quarries	○ ○ ○				● ● ●	
IS	In-situ	terrazzo: cement based resin based	○ ○	● ●	● ●			
ISU	In-situ utilitarian	concrete granolithic			● ●			
ESR	Extra slip resistant	non-slip pvc sheet: welded joints ceramic tiles: epoxy joints non-slip resin based				● ● ●		
T	Textile	woven tufted bonded flocked fibre bonded (needle punch)						● ● ● ● ●

Where anti-static properties are not specified, finishes in Group SW; TREJ; TRJC or IS may also be suitable. These are marked with "○".

3 Design guidance

3.1 Range of finishes

3.1.1 Thin flexible finishes

Thin flexible finishes are normally laid on a screed and it is essential that this should be of adequate strength, well compacted and with a smooth surface. Any blemishes, trowel marks and minor defects in the surface of the screed, will show through a thin finish.

The use of smoothing compounds to obtain a satisfactory surface to receive a thin finish is not recommended. Experience has shown that this combination has often resulted in damage to the floor from mobile equipment and traffic (see 3.5.9).

A minimum thickness of 2.5 mm for flexible finishes is therefore recommended for general use in health buildings.

See BS 8203: 'Sheet and tile flooring' for guidance on flexible finishes.

Refer to manufacturers' product literature for details of finishes available on the market.

3.1.2 Clay tiles and cementitious finishes

These are normally supplied and laid using traditional materials and skills. The publications listed in the References section give specification and installation guidance but the following are particularly relevant:

- CP 202: 'Tile flooring and slab flooring'
- BS 8204: 'In-situ floor finishes'
- C & CA Advisory Note: No 48024 'Terrazzo finishes'
- The National Federation of Terrazzo and Mozaic Specialists: 'Specification of pre-cast and in-situ terrazzo and mosaic'.

3.1.3 Resin based finishes

These are supplied and laid by specialists employing new and continuously evolving materials and techniques.

Specification, mix, workmanship and environmental conditions during laying and protection of the finished floor must be carefully controlled.

Refer to manufacturers'/installers' product literature for details of finishes and laying instructions which should be strictly adhered to.

3.1.4 Textile floor coverings

Refer to manufacturers' product literature for details of their coverings.

Recommendations for their installation and advice on the selection of materials and their properties are contained in BS 5325: British Standard Code of Practice for the installation of textile floor coverings.

Manufacturing details are given in Health Notice (78)32.

3.1.5 Skirtings

The preferred solutions at junction of wall and floor finish are as follows:

Thin flexible finishes:
- pre-formed pvc linoleum sit-on type skirting for pvc tile floors
- pre-formed pvc linoleum set-in type skirting for welded sheet floors. Vertical joints should be welded or sealed with appropriate joint filler
- alternatively the floor covering may be taken up the wall, backed by a suitable cove.

Clay tiles:
- skirting tile to match the floor finish.

Cementitious finishes:
- coved skirting formed in-situ from floor material.
- no skirting is necessary where utilitarian finishes abut fair faced brickwork.

Resin finishes:
- coved skirting formed in-situ from floor material.

Textile floor coverings:
- wood and pvc skirting.
- alternatively the textile covering may be taken up the wall, backed by a suitable cove.

3.2 Guide to selection of finishes

The schedule in Appendix A relates categories of performance to groups of suitable finishes for activity spaces in all of the major departmental areas in health buildings.

3.3 Characteristics of finishes

The characteristics of the finishes listed in 2.3 are given in this section. Manufacturers should be consulted regarding proprietary products. The reference number of the relevant British Standard is given where one exists. The gradings of slip resistance are from BS 5395: Table 3.

3.3.1 Anti-static

All anti-static floor finishes must comply with HTM 2 – Anti-static precautions: flooring in anaesthetising areas. Users are advised to consult manufacturers regarding the need for an underlay.

Group Ref	Description	Usual thickness mm	Characteristics
AS	Anti-static pvc sheets welded joints	2.0 **2.5■** 3.2	• similar to Group SW in 3.3.2 • minimal jointing reduces possibility of failure from wheeled traffic, shrinkage and moisture penetration
AS	Anti-static pvc tiles welded joints	2.0 **2.5■** 3.2	• similar to Group TF in 3.3.2 but with welded joints • number of joints increases possibility of failure as above
AS	Anti-static terrazzo tiles & slabs to BS 4131 & BS 4357	15-40	• similar to Groups TREJ and TRCJ in 3.3.3
AS	Anti-static in-situ	Up to 60 for whole system	• similar to Group IS in 3.3.4
AS	Anti-static in-situ resin based	3-12	• similar to Group IS in 3.3.4

3.3.2 Thin flexible finishes

(See 3.1.1 for guidance on the use of thin flexible finishes)

Sheet and Sheet with welded joints.

The term 'welded joints' embraces the sealing of joints by methods appropriate to the material.

Group Ref	Description	Usual thickness mm	Characteristics
S & SW	pvc sheet: BS 3261: Type A	2.0 **2.5■**	• good recovery from indentation • flexible • slip resistance grading: 'very good' when dry, 'fair to poor' when wet • requires dpm in ground floor applications • good resistance to chemicals • fair resistance to cigarette burns
S & SW	pvc resilient backed sheet: BS 5085: Part 2	2.5 to 4.5	• generally as for unbacked pvc but less resistant to indentation • good impact sound reduction • suitable for foot and light wheeled traffic only
S & SW	Linoleum sheet: BS 810	**2.5■** 'special grade' **3.2■** 4.5	• good recovery from indentation • 'special grade' means having high resistance to indentation • flexible • slip resistance grading: 'good' when dry, 'fair to poor' when wet • requires dpm in ground floor applications • resistance to chemicals may not be as good as pvc • must be bonded to screed • has good resistance to cigarette burns

■ preferred thickness for health buildings

Tile: Flexible

Group Ref	Description	Usual thickness mm	Characteristics
TF	pvc tiles: BS 3261: Type B	2.0 **2.5■**	• generally as for pvc sheet
TF	Linoleum tiles: BS 810	**2.5■** 'special grade' **3.2■**	• generally as for linoleum sheet
TF	Semi-flexible pvc tiles: BS 3260	2.0 **2.5■**	• good resistance to indentation • relatively inflexible • slip resistant grading: 'good' when dry, 'fair' when wet • dpm advisable in ground floor applications • resistance to chemicals not as good as pvc • negligible sound absorption • manufacturers descriptions vary but basically all tiles are manufactured to BS 3260. Tiles free of asbestos are now obtainable.

■ preferred thickness for health buildings

3.3.3 Rigid tiles

A with epoxy joints
(Can be damaged by structural movement.)

Group Ref	Description	Usual thickness mm	Characteristics
TREJ	Ceramic tiles:	8 to 12.5 up to 19 for special duty	• easier to clean with plain or lightly textured face • slip resistance grading: plain tiles: 'good' when dry, 'fair to poor' when wet • resistant to most chemicals and bacteria • epoxy jointing ensures resistance is maintained throughout the floor surface
TREJ	Terrazzo tiles: cement based: BS 4131	15.0 to 40.0	• slip resistance grading: 'good' when dry, 'fair to poor' when wet • attacked by strong acids and caustic alkalis

B with cement joints
(Can be damaged by structural movement.
Joints will lack the chemical resistance of epoxy jointing.)

Group Ref.	Description	Usual thickness mm	Characteristics
TRCJ	Ceramic tiles: BS 6431	8 to 12.5 up to 19 for special duty	• As TREJ
TRCJ	Clay floor quarries: BS 1286	8 to 12.5 up to 19 for special duty	• performance generally slightly inferior to that of ceramic tiles
TRCJ	Terrazzo tiles: cement based: BS 4131	15.0 to 40.0	• as TREJ

3.3.4 In-situ

Group Ref	Description	Usual thickness mm	Characteristics
IS	Terrazzo: cement based	max 60 for complete system	• slip resistance grading: 'good' when dry, 'fair to poor' when wet • attacked by strong acids and alkalis • can be easily damaged by structural movement
IS	Resin based as follows:		Resin based finishes generally:
	Epoxy mortar	5 - 6	• hard wearing and inherently jointless
	Epoxy self-levelling systems	2 - 3	• good resistance to chemicals and cleaning agents, particularly the epoxy types
	Polyester	up to 5	• extra slip resistance can be provided in the mix
	Polyurethane	up to 10	• dpm required in ground floor locations
	Neoprene	3 - 12	• surface finishes vary from trowelled to mechanically ground

Manufacturers' product literature should always be consulted before a choice is made.

3.3.5 In-situ: utilitarian

Group Ref	Description	Usual thickness mm	Characteristics
ISU	In-situ concrete	75 (min)	• strong but surface prone to dusting unless specially treated • scope for application very limited
ISU	Granolithic	40 (min) when laid on mature base concrete 20 when laid monolithically on a freshly laid concrete base	• provides a hard wearing strong topping to a concrete base • may be used as a finish or as a high bearing strength screed to receive another finish • slip resistance grading: 'good' when dry, 'fair to poor' when wet • extra slip resistance can be provided in the mix
ISU	Mastic asphalt	20 - 30	• grade III suitable for general purpose industrial flooring • slip resistance grading: 'good' when dry or wet

3.3.6 Extra slip resistant

Group Ref	Description	Usual thickness mm	Characteristics
ESR	pvc sheet: welded joints	2.0 **2.5**■	• with integral extra slip resistant surface • slip resistance grading: 'very good' when dry, 'good' when wet
ESR	Ceramic tiles: epoxy joints	See manufacturers' product data	• manufactured with grooved, ribbed, textured, dimpled, studded surfaces or carborundum finish to enhance slip resistance • slip resistance grading: 'very good' when dry, 'good' when wet. Carborundum finish 'very good' when wet or dry.
ESR	Resin based	See manufacturers' product data	• some finishes possess inherent extra slip resistance properties

■ preferred thickness for health buildings

3.3.7 Textile

General to all carpets:

- carpets offer greater comfort and in some areas can create a 'domestic' atmosphere.
- in addition to a pleasant 'tread', carpets provide 'very good' slip resistance when dry and 'good' slip resistance when wet
- carpets provide high sound absorption and elimination of noise from footsteps
- despite their softness a risk of injury in the form of 'friction burns' is possible to some degree with some types of carpet. A specific example is quoted in Item 22/81 Hospital Equipment Information No 90
- certain synthetic piles, if not properly treated, can cause static electricity problems
- all carpets can suffer from cigarette burns, but the synthetic piles are prone to char much more than wool
- they are less suitable for areas prone to frequent wet spillage and soiling
- the deeper pile carpets are not suitable for areas subject to much wheeled traffic

Group Ref	Description	Characteristics
T	Woven	• traditional carpets (Axminster and Wilton) • good performance from highest quality product
T	Tufted	• can be identical in appearance to woven and has similar qualities
T	Bonded	• performance similar to woven and tufted • has medium pile • hard wearing
T	Flocked	• the very short pile requires compatible cleaning equipment • more able than other types to withstand wet spillage • very hard wearing but especially prone to cigarette charring
T	Fibre bonded (needle punch)	• considered the 'cheaper end' of the soft floor covering market • hard wearing but inferior appearance retention • less suitable for use in areas prone to frequent wet soiling, particularly food and drink.

Performance classification for:–

A. Woven, tufted, bonded and flocked carpet

As a guide to selection, the British Carpet Classification Scheme applies.

Qualities are classified by a system of allocating points for certain properties and requiring the attainment of minimum criteria for others.

Where relevant, British Standard test methods are employed to cofrm performance levels (see 2.2.2).

Properties considered include:
- effective pile weight
- dynamic loading
- static loading.

Mandatory minimum criteria include:
- wet fastness
- shampoo test
- light fastness
- tuft anchorage.

Performance ratings

The scheme gives six ratings of performance and describes a broad application for each. The following ratings are suitable for health buildings:

Rating	Description	Application
A	Extra heavy wear	Location where very high standards are required
B	Very heavy wear	The heaviest domestic use and most contract areas
C	Heavy wear	For busy domestic areas and medium contract use

B. Fibre bonded (needle punch) carpet

The Fibre Bonded Carpet Manufacturers Association offers a classification scheme based upon the construction of the product and the attainment of minimum performance levels against a range of British Standards and other tests.

Performance ratings

The scheme gives five grades of performance. The following are suitable for health buildings:

Grade	Application
3	General domestic/medium contract
4	Heavy domestic/general contract
5	Heavy contract

3.4 Construction details

3.4.1 Thickness of flooring system

The different thicknesses of floor finishes will require different thicknesses of screeds. Where a flooring system is thicker than the common dimension a decision must be made as to how it will be accommodated, eg by adjusting the levels of the base.

The thickness of a screed will be the minimum constructural thickness required plus an allowance for the permissible deviation of the base. See section 6.2 – Variations in level.

3.4.2 Structural movement

Experience has shown that structural movement has been directly responsible for a number of failures of flooring systems, particularly where the finish has been of rigid tile or in-situ flooring.

The structural engineer should be consulted, before the flooring systems have been selected, to ensure that the structure is stiff enough to prevent deflection or deformation capable of cracking the flooring systems.

Stresses and movement that should be taken into account include those arising from:

- creep
- shrinkage
- self weight
- dead loads
- live loads
- stresses arising during construction.

Some resin and pvc finishes require an underlay to help minimise cracking due to structural movement (see manufacturers' product literature).

3.4.3 Location of movement joints in flooring systems

It is essential that consideration be given to the location of movement and daywork joints at the detail design stage. They should not be located in areas such as operating theatres and kitchens where they may cause micro biological hazards as a result of water and grease penetration.

3.4.4 Protection against damp

Most flooring systems are affected by moisture, therefore a damp proof membrane should always be provided to ground floors and also to upper floors where there is the risk of penetration of water to the floor below.

The dpm can be installed above or below the base. The preferred position is below as it will allow the use of bonded screeds. When installed below the base the dpm may be laid on a concrete or sand blinding of the hardcore. The membrane must be returned vertically to finished floor level around the perimeter.

An added advantage with the dpm in this position is that it protects the base and screed from attack by sulphates which may be present in hardcore or ground water.

Protection against damp in a suspended slab will entail either an unbonded screed and a membrane or asphalt which will serve as both screed and membrane.

For further information see:

- CP102: Protection of buildings against water from the ground
- BRE Digest 54: Damp proofing solid floors.

3.4.5 Noise control

Steps should be taken to reduce the transmission of sound through the structure of health buildings by dealing with it at source. Textile floor coverings and resilient backed sheet finishes are helpful.

Alternatively a floating floor system on a sound insulating membrane can be used.

3.4.6 Adhesives

Before any adhesive is applied, it is necessary to ensure that the sub-floor or base is structurally sound, smooth, clean, dry, free from dust, grease, oil, paint, polish or any other contaminant that may affect adhesion. A concrete sub-floor or cement sand screed must be fully cured and without laitance. An effective damp-proof membrane must be provided where necessary in relation to the floor covering used. The site conditions should comply with CP 8203 and good ventilation needs to be provided to enable adhesives to dry and also afford the dissipation of vapours from solvent based adhesives.

The moisture content of the concrete sub-floor must not exceed 75 per cent RH as measured by hygrometer before any adhesive or floor smoothing compound may be applied.

A guide to the types of chemical adhesives to suit various floor coverings can be found in BS 5442, Part 1, 1977, 'Classification of adhesives for construction, flooring materials.

It is important that full details of the sub-floor and other site conditions are made known to the flooring manufacturers and/or contractors at specification stage to ensure that the most suitable adhesive is used.

Release adhesive systems are available to facilitate cleaner removal of foam backed carpet when replacement is necessary.

The need for priming to screeds should be checked.

Reference should be made to technical data which is provided by the adhesive manufacturer.

- The recommendations in this section are based on information provided by the Contract Flooring Association

3.5 Screeds

3.5.1 General

A satisfactory screed will only be achieved as a result of careful attention to the following:

- specification of the appropriate thickness, design mix, materials and workmanship
- preparation of the base
- mixing, laying and compacting
- finishing, curing and protecting
- slump testing during laying and testing the installed screed with the BRE impact tester.

This can be achieved only by a high standard of site supervision.

3.5.2 Materials

Materials should comply with the following:

- BS 12 Ordinary and rapid-hardening Portland cement
- BS 882 Aggregates from natural sources for concrete (including granolithic)
- BS 1076 Mastic asphalt for building (limestone aggregate)
- BS 8204 In-situ floor finishes.

3.5.3 Workmanship

To establish standards of workmanship reference should be made to the following:

- BRE Digest 104: 'Floor screeds'
- C & CA Advisory Notes:
  48023 'Floor screeds'
  48040 'High strength concrete topping for floors including granolithic'
  48046 'Laying floor screeds'
- National Federation of Plastering Contractors: 'Guidance note on floor screeds and finishes'
- National Building Specification: Section P12, Screeds/Toppings.

3.5.4 Screed strength

The best indication of the bearing strength of a screed is obtained by following the methods set out in Appendix D. While the compressive strength can be assessed by crushing cubes of cured material, the cube test provides little indication of the strength of an installed screed. It should be seen therefore as a method of quality control rather than an indication of performance

High Bearing Strength Screeds

The addition of a coarse hard aggregate to a cement and sand mixture greatly enhances its strength. For this reason granolithic and fine concrete screeds which both incorporate such aggregates are described as high bearing strength (see table in 3.5.7). Possible applications for these higher performance screeds are given in 3.6.

A properly mixed and compacted 1:3 cement and sand screed or a heavy duty proprietary screed come within this description.

3.5.5 Types of construction

The following types of screed construction are in general use (see table in 3.5.7):

- monolithic – the screed is laid as a topping to the base concrete while it is still green, ie within three hours of being placed (or lesser time in hot weather). This type of construction ensures complete adhesion of the screed reducing problems of differential shrinkage. Difficulties can arise from the need to protect the screed perhaps for long periods during construction.
- bonded – the screed is laid on a hardened concrete base. A cement slurry or proprietary agent may be used to adhere the screed to the base which must be properly prepared by mechanical or other means to obtain maximum adhesion.
- unbonded – the screed is separated from the base, eg by the presence of a damp proof membrane, and therefore cannot adhere to it. This type of screed will usually be much thicker than those of monolithic or bonded construction with the exception of asphalt. Precautions will need to be taken to reduce the risk of 'curling' along joints.

3.5.6 Mastic asphalt

Mastic asphalt to BS 1076 Grade 1 'special hard flooring' is suitable for use as a screed in health buildings, but even that grade is not recommended for operating theatres or areas subject to heavy wheeled traffic.

The surface upon which mastic asphalt is laid must be true and level. In the case of a concrete base this could mean the laying of either a cement and sand screed or a regulating course of asphalt to level up irregularities in the surface.

Asphalt screeds are ready to receive the finish in a very short time.

Some adhesives contain solvents that will attack the bitumen in mastic asphalt. Care must be taken when specifying the floor finish to ensure that a compatible adhesive is used. A smoothing/levelling compound may be required to assist the adhesion or to overcome the unavoidable surface imperfections inherent in this material.

Mastic asphalt specifications for roofing or external paving are not suitable for flooring installations.

For further information see:

- BS 1076 Mastic asphalt for flooring (limestone aggregate)
- BS 8204 In-situ floor finishes
- Mastic Asphalt Council and Employers Federation – 'Flooring with mastic asphalt'.

3.5.7 Available screeds

Description of screed	Type of construction	Thickness mm	Mix (by weight)	Remarks
cement and sand	monolithic	12 - 25 (max)	1:3 cement: fine aggregate	
	bonded	40 (min)	1:3 cement: fine aggregate or 1:4½ cement: fine aggregate	1:3 mix suitable for thin sheet finishes fixed with adhesive. Can give high bearing strength
	unbonded	50 (min)		1:4½ mix suitable for other finishes including textile. See note in 3.5.5 regarding curling.
modified cement and sand	bonded	See manufacturers' data		Suitability as for cement and sand but with additional attributes – see manufacturers' data
	unbonded			
synthetic anhydrite	unbonded	26 (min)	See manufacturers' data	Sensitive to water and should never be used in areas where water penetration is likely. Must always be laid on a dpm on ground floors. Should be protected from moisture prior to laying of finishes.
granolithic	monolithic	12 - 25	1:1:2 cement: fine aggregate: coarse aggregate	High bearing strength
	bonded	40 (min)		
fine concrete	bonded	20 - 40 (in-situ base) 100 (min) (pre-cast base)	1:1½:3 cement: fine aggregate: coarse aggregate	High bearing strength Where a screed exceeds 65 mm thickness, fine concrete should be considered
	unbonded	75 (min)		
mastic asphalt	bonded	15 - 20	see manufacturers' data	Not recommended for operating theatres and areas subject to heavy wheeled traffic BS 1076 Grade 1 'Special hard flooring' is suitable for use elsewhere in health buildings.

3.5.8 Preparation of base to receive finish direct

Power floating or grinding of the surface of the base is another method of providing a smooth, level surface to receive finishes, particularly in areas which may be subject to heavy loading.

Provision should be made in the design of the base for this treatment, particularly in the case of suspended slabs because excessive deflection cannot be corrected as in normal screeding.

This form of preparation may require the use of a smoothing/levelling compound.

See Cement and Concrete Association Advisory Notes: Nos 48034 and 48040.

3.5.9 Smoothing/levelling compounds

The use of smoothing/levelling compounds on screeds to receive thin flexible finishes is not recommended as discussed in 3.1.1 but where it is unavoidable they must be:

- of a type which does not promote or sustain the growth of bacteria or fungus
- capable of being combined with a mineral aggregate filler to form thick layers of material
- strong enough to resist loads imposed by furniture, equipment and other traffic
- compatible with the screed and adhesive used in laying the finish.

3.6 Areas with special requirements

3.6.1 Operating theatres and ancillary accommodation

Loading
Floors can be subjected to severe static and dynamic loading. Progressive failure of a flooring system can stem from initial small faults in the jointing of the finish, or from insufficient bearing strength or poor workmanship in laying the screed.

The structural details and the selection and installation of the flooring system must be given meticulous attention.

One of the earliest considerations for the design team should be the type of operating theatre table which will be used as this will have an important bearing on the type of flooring system selected and the structural design.

Fixed and mobile tables are available and of the two, mobile tables are more generally used.

Most tables have small hard castors rigidly mounted but some are available with large soft tyred wheels. Castors with softer tyres giving a greater contact area with the floor can be fitted to new or old tables. This measure will significantly reduce possible damage to the floor.

Flooring should be hard-wearing and durable to resist the heavy loadings caused by mobile equipment and should be impervious to the passage of moisture.
uSee 3.4.2 'Structural movement' and 3.4.3 'Location of movement joints in flooring systems'.

Finishes
Flexible sheet and tile with welded joints:

Trouble free performance depends upon three factors:

- quality of the welded joints
- adhesion of the finish to the screed
- strength and smoothness of the screed

Mobile equipment can be the cause of eventual failure. Frequent inspection is necessary and it is essential that damage is repaired as quickly as possible.

Cement based terrazzo tile:

Damage may be caused by structural movement or unsatisfactory bedding of the tile. Exposed edges and raised or out-of-level joints are particularly vulnerable to damage by heavy mobile equipment. Tiles should be fully cured before laying to prevent shrinkage. Dividing strips should be taken down to a firm base.

In-situ cement based terrazzo:

Extremely vulnerable to failure from structural movement. In certain instances the conductive performance of anti-static types has proved to be unreliable. Dividing strips should be taken down to a firm base.

Resin based finishes:

To date very few proprietary finishes have been found entirely satisfactory for use in these locations. Some are available with anti-static properties.

Screeds
A high bearing strength screed should be installed wherever an operating table can be moved. A properly mixed and compacted 1:3 cement and sand screed or a heavy duty proprietary screed should be satisfactory. Granolithic and fine concrete are also suitable materials (see 3.5.4 and 3.5.5 and Appendix D).

Close supervision should be maintained at all stages of the work and extensive use made of the BRE impact tester to ensure that the screed is adequately compacted and bonded to the base if of the bonded type.

The use of levelling compounds and fillers should be discouraged but where they have to be used they must be at least as strong as the screed (see 3.5.9).

Variations in level are fully explained in 6.2.

3.6.2 Showers

The needs of walking, disabled and wheelchair patients must all be taken into account when designing showers. The height of a floor mounted shower tray presents a barrier to a wheelchair patient so the preferred solution would be one where the showering area is dished below the level of the surrounding floor. Gently graded access ramps should provide an approach to the shower. The level of the structural slab may have to be adjusted to accommodate any changes in the depth of the flooring system.

The finish should be extra slip resistant and dressed into a floor outlet (see HTM 64: Sanitary assemblies).

3.6.3 Main kithens

The essential performance requirements of the finish are the need to combat the slipperiness caused by water and grease lying on the surface, and the need to maintain the high level of hygiene required in food preparation areas.

Ceramic tiles jointed with an epoxy based grout will normally fulfil these requirements.

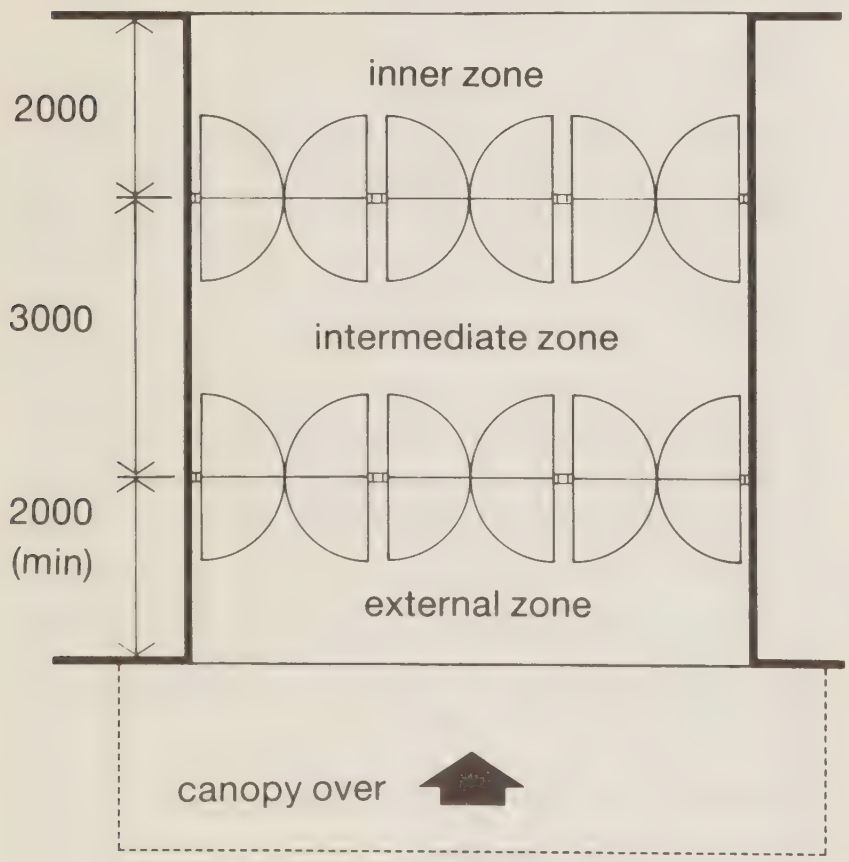
Tiles with grooved, ribbed, dimpled, studded or heavily textured surfaces should not be used as they may retain grease and prove difficult to clean.

Tiles are available with a lightly textured surface pattern especially designed to enable grease and dirt to be easily removed.

The skirting should be in similar tiles at least 100 mm high, coved at the junction with the floor tiles and jointed in the same material.

3.6.4 Entrances

Much damage and soiling can be caused by dirt, grit and liquids brought into a building on the feet of those using it. The diagram below illustrates a



Suitable types of flooring

External zone
- concrete
- rough paving
- barrier mat with built-in scraper action

Intermediate zone
- barrier mat with built-in scraper action

Inner zone
- dust control mat
- barrier mat with built-in scraper action

External zone material should extend as far as possible into the canopy area.

Inner zone material should extend inwards as far as possible.

The dimensions stated relate only to the removal of soil from shoes and wheels (see Health Notice (78)32).

3.6.5 Streets and corridors

These areas must be capable of withstanding the loads imposed by heavy wheeled traffic and intensive pedestrian traffic.

In selecting and specifying the system the following points need to be considered:

- type and volume of traffic will vary greatly depending upon whether the corridor is used as a main whole hospital service street, or is used solely by one department.
- mobile equipment may range from wheelchairs and small trolleys to comparatively heavy battery-powered 'tugs' hauling a train of loaded trucks.
- a high bearing strength screed is recommended (see 3.5.4). Wherever possible movement and expansion joints should be located in positions where wheeled equipment will cause minimum damage.
- joints in the floor finish can be a source of progressive failure in heavily trafficked areas and finishes requiring the minimum amount of jointing should be chosen in such areas. Flatness of the surface is important in minimising damage to the floor finish.

3.6.6 Radiodiagnostic rooms

The equipment in this activity space may change several times during the life of the department and it is possible to provide flexibility in the construction of the floor to allow for alterations (see Health Building Note No. 6). Hollow floors are sometimes used but must provide structural support for the table and other heavy equipment. Floors to radiodiagnostic rooms, processing and associated accommodation should be jointless and impervious.

4 Project documentation

4.1 Drawings and schedules

The architectural and engineering design processes should produce finally agreed and fully co-ordinated room layouts presenting the following information:

- the selected flooring system with skirtings for each activity space, including staircases, identified by a project reference system
- the finished floor levels, with the flooring system thickness and location of areas of greater or lesser thickness
- the location of all expansion and movement joints
- the location of engineering services penetrating the flooring system with positions of terminals in the floor finish
- the location and identification of junctions with differing floor finishes at openings, with floor mounted components and equipment and the positions of components set into the screed, eg floor springs.

Drawings to a larger scale should be prepared illustrating:

- staircase finishes
- junction details
- method of constructing partitions, eg off sole plates, haunchings etc

Drawings should also be prepared illustrating full details with permissible deviations in levels of flooring in areas with special requirements, eg operating theatres, entrances, radiodiagnostic rooms etc.

Associated schedules should also be prepared setting out the following information for each flooring system as appropriate:

floor finishes and skirtings:
- material
- surface treatment
- thickness
- colour
- pattern
- jointing
- specification by BS or by manufacturer's name and reference
- adhesives

screeds:
- type of construction
- materials and mix, proprietary name
- thickness
- surface finish

beds for rigid tiles:
- materials and mix
- thickness

underlays:
- material
- thickness

damp proof membranes:
- material
- thickness
- if sheet materials, how jointed or lapped

accessories:
- stair nosings
- diminishing strips

The National Building Specification is widely used for health building work and specifiers should refer to Appendix B for a list of sections relevant to flooring systems.

4.2 Bills of quantities

The bills should contain a description with quantities of the selected flooring systems by reference as appropriate to British Standards, or manufacturers' products.

The bills should also contain any specific programming requirements (see 6.1) and any special methods of protecting screeds and finishes (see 6.11).

5 Methods of Procurement

Floor finishes are normally supplied and laid by the main contractor within the building contract.

However, certain floor finishes, eg carpets and pvc sheet and tiles, are available to Health Authorities through the Crown Suppliers Central Call-off contract arrangements. Two options are available for procuring and laying these finishes:

- they may be purchased directly by the Health Authority and laid by the main contractor, or
- they may be purchased directly and laid by the Health Authority after practical completion of the building contract.

The contract documents should describe the method selected and any work to be included in the building contract measured in the bills, so that the main contractor is fully aware of his responsibilities.

6 Site practice

This section sets out guide lines for good practice in installing flooring systems. If any of the items are to be made contractually binding they should be included in the contract documentation (see 4.2).

6.1 Programming

The main aim in programming flooring is to make sure that screeds are laid as late as possible, but allowing time for drying out and curing, before finishes are laid. This should reduce to a minimum damage caused by other trades and the possibility of rippling and curling of the screed.

In any event, screeds should not be laid until the building has been weather sealed and appropriate temperature and humidity conditions maintained.

Solid masonry partitions should be constructed directly on the structural base and screeds in spaces bounded by these can be laid late in the programme without causing any damage to the partitions.

Hollow plasterboard partitions may be erected before or after the screed is laid (see HTM 56: Partitions).

Monolithic screeds will be laid early in the programme while the base concrete is still green and it is essential that those screeds are adequately protected as they will be exposed to damage over long periods of time. Screed and base may take months to dry out.

After the partitions and screeds have been completed, the floor finish should be laid and skirtings fixed. This latter work should be co-ordinated with other finishing trades and particularly with the fixing of doorsets. Junctions between flexible floor finishes and skirtings and door frames and architraves are illustrated in HTM 58: Internal doorsets.

6.2 Variations in levels

These should be clearly specified both for the base (to ensure a uniform thickness of flooring system) and for the finished floor as follows:

Base:
BS 5606: Code of Practice for Accuracy in Building, specifies a permissible deviation (PD) in level with reference to the nearest transferred bench mark of ± 10 mm at any point under a 1.5m straight edge.

Finished surface of floor:
BS 8204: In-situ floor finishes, offers advice regarding screeds and bases. It sets out tolerances on level and surface regularity in terms of deviation from a parallel plane over a large area of floor, as well as over small local areas.

This is set out in the following table:

Classification of surface regularity (SR)

Class	Maximum permissible deviation from a 3m straight edge held in contact with the floor	Maximum permissible deviation from datum level over total floor surface
SR1	3 mm	10 mm
SR2	5 mm	15 mm
SR3	10 mm	

The difference in height across joints should be less than 2 mm in Classes SR1 and SR2.

Classes SR1 and SR2 will apply to most floors in health buildings.

BS 8203: Sheet and tile flooring, does not specify tolerances but warns that the tolerances for evenness of screed surface specified in BS 8204 will not ensure the smoothness required for thin flexible finishes (see 3.1.1 and 3.5.9).

It is important that there are no sudden changes in level or differences in levels across joints, especially in areas subject to heavy moving loads.

Operating theatre floors should be laid to finer tolerances than those described in the above table.

Operating table castors may not all be in contact with the floor at any one time if the finish is uneven. The resulting increase in point loads can cause failure in the flooring system. To reduce this risk localised variations in levels of 1.5 mm under a 1m straight edge over the table movement zone should be maintained.

Practicality and costs should be weighed before specifying this degree of accuracy.

6.3 Daywork joints

Wherever possible these should be located beneath partitions when screeds are laid before partitions are erected. See CP 94/74 Rippling in Flooring.

6.4 Storage of materials

Materials should be stored under cover and in accordance with the manufacturers' instructions. The time that materials are stored on site should be kept as short as possible to reduce the risk of deterioration.

6.5 Preparation of base to receive screed

The bond between the screed and the base concrete must be the best possible. Investigation has shown that an unsatisfactory interface between screed and base can be one of the principal causes of floor system failure.

Proprietary bonding agents may be used but these are no substitute for mechanical hacking (scrabbling) or grit blasting to remove laitence and ensure a good key. All loose material should be removed and the floor suction cleaned.

The base should be soaked, preferably overnight, and after any surplus water has been removed a cement grout should be brushed into the base concrete just prior to screed laying.

6.6 Batching

All mixes based on cement and sand must be batched by weight, and the water content should be the minimum required to provide a workable mix consistent with obtaining full compaction.

6.7 Mixing

Mixers of the 'free-fall' type cannot be relied upon to mix low moisture content screed material thoroughly. All cementitious screeds should be mixed in a forced action mixer of the trough or pan type to prevent the cement 'balling'.

Ready mixed material can be specified as an acceptable alternative.

6.8 Compacting

Many screed failures are attributable to the lack of compaction of poorly mixed screed materials. Mechanical aids should be employed wherever appropriate to overcome this problem.

6.9 Testing

Quality control of materials should be practised at all times prior to mixing and the degree of compaction obtained in the installed screed should be tested using the impact tester described in BRE Current Paper CP72/78. (see Appendix D for methods of testing screeds.)

6.10 Drying out

The screed should be sufficiently dry before the finish is laid. Time required for drying out will vary with the thickness and moisture content. Under favourable conditions unbonded screeds may take twenty four hours per mm of thickness to dry out, bonded screeds may take longer.

Measurement of the electrical conductivity of the screed will give a quick approximation of its moisture content and indicate progress in drying out. Testing with a hygrometer will be required to establish accurately whether it is in a fit state to receive the finish. For further details refer to BS 8203.

6.11 Protection

Protection of screeds to avoid damage and contamination is always to be preferred to repair of damaged screeds. This must be impressed on the main contractor before any screeds or finishes are laid.

The screed surface must be smooth and strong if the finish is to be properly bonded to it. If the screed surface is damaged there is no completely satisfactory method of restoring these characteristics.

Damage from impact is just one of the hazards a screed may be subjected to before the finish is laid. Others include paint and plaster droppings which will severely affect the bonding of the finish and must be removed before laying operations commence.

The method of protection is not generally specified and is therefore often left to the discretion of the contractor whose responsibility it is to produce finished work to an acceptable standard. This may be acceptable practice where the preferred method of laying screeds late in the programme is adopted, as the screed is left exposed only for the time allowed for drying out and curing.

When screeds are laid early in the programme and are left exposed for long periods of time, it is essential that they should be adequately protected from damage from other trades and traffic and that the method of protection of screeds be specified (see 4.2).

Finishes must also be adequately protected and handed over free from damage, marking and contamination.

Where methods of protection of screeds or finishes are specified it should be borne in mind that the financial risk may be transferred from the main contractor to the client.

6.12 Defects

Once the surface of a screed has been damaged it cannot easily be restored. The most satisfactory method of making good the damaged area is to remove the defective material completely back to the base and replace it with new screed. Should this not be practicable, defective screeds should be made good as follows:

- narrow cracks can be repaired by filling them with a mixture of thermo-setting resin and sand in the ratio of 6:1 by weight.
- wider breaks in the screed can be made good by a well compacted mixture of cement and sand containing a high proportion of cement eg 30% by weight
- by the application of a suitable smoothing/ levelling compound (see 3.5.9)

In addition to defects to the surface, lack of adhesion of bonded screeds to the base should be determined by the use of the BRE impact hammer and the affected area cut out and renewed.

6.13 Standards of workmanship

Sample areas:
A sample of each type of screed and complete flooring system should be laid in a sample room or area to establish standards of workmanship and to test screeds before proceeding with the main areas of work.

The location of the room in relationship to the direction of daylighting is important.

Finishes
Floor finishes should be laid in accordance with the manufacturers' instructions and with British Standard Specifications and Codes of Practice eg:

- CP 202: Tile flooring and slab flooring
- BS 8203: Sheet and tile flooring
- BS 8204: In-situ floor finishes
- BS 5325: Code of Practice for installation of textile floor coverings.

7 Maintenance

7.1 General

A project maintenance manual should be compiled by the architect and handed to the maintenance staff at practical completion of the contract. The manual should include the following information:–

- names of floor finishes or systems and manufacturer or proprietor,
- any adhesives used, if known,
- screeds,
- damp proof membrane,
- structural floor base,
- instructions on cleaning and maintenance.

It is good practice for PVC finishes in Operating theatres to be checked regularly – e.g. every Friday night – so that any split welded joints or loose areas can be made good before theatres are used for future operating sessions.

7.2 Cleaning

Indicative cleaning routines are set out in 2.2.1 and 2.2.2.

Certain cleaning agents can result in shrinkage of pvc flooring (see BRE Current Paper CP9/79) resulting in the opening up of joints in tiled floors or the rupture of the welding of sheet pvc floors. The project team should therefore ensure that the specification of the pvc flooring systems are communicated to those responsible for floor cleaning.

Highly alkaline cleaning agents should not be allowed to build up on ceramic tiled floors as this can cause severe slipping problems and be very difficult to remove.

Appendices

A Schedule of activity spaces

Where an activity space under consideration does not appear in the schedule, refer to space of a similar type.

Where two categories of performance are shown against some activity spaces, either category may satisfy the user requirements.

A preferred finish (see fourth column of the schedule) is one which has been found to be the most commonly acceptable one of its group for the particular activity space.

For cost reasons it may be important to rationalise floor finishes within a department where there is a choice of different finishes within one performance category e.g. floor finishes in bays off a circulation space will generally be the same as those in the circulation space.

For ease of reference to the schedule, the information in section 2 relating to the physical and performance characteristics, categories of performance, and coded references to floor finishes is summarised in a fold out sheet at the end of this appendix.

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Accident and emergency

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	5	S/SW	—
Cleaners Room	2	SW	—
Cleansing Room/ Shower	4	ESR	—
Clean Utility	3	SW	—
Consulting	3/6	SW/T*	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Drugs and Alcohol Recovery	4	ESR	—
Interview Room	5/6	S/TF/T	T4
Major Treatment	1	AS	—
Office	5/6	S/TF/T	T4
Reception/ Records	5/6	S/TF/T	T4
Resuscitation	3	SW	—
Staff Base	3	SW	—
Store	5	TF	VA
Treatment	3	SW	—
WC	2	SW	—

Administration

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	5/6	S/TF/T	T5
Cleaners Room	2	SW	—
Committee Room	6	T	T4
Common Room	6	T	T4
Interview Room	6	T	T4
Library	6	T	T4
Office	5/6	S/TF/T	T4
Reception	6	T	T4
Rest Room	6	T	T4
Store	5	TF	VA
WC	2	SW	—

Adult acute - Day care and treatment

Department/ Activity Space	Category	Group	Preferred Finish
Bathroom	4	ESR	PVC
Circulation Space	5/6	S/T*	—
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Consulting/ Examination/ Doctors Office	3/6	SW/T*	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Major Treatment	1	AS	—
Multi-bed Room	3/6	SW/T*	—
Office	5/6	S/TF/T	T4
Patient Changing Cubicle	5/6	S/T*	—
Patient Waiting	5/6	S/T*	—
Shower	4	ESR	PVC
Single-bed Room	3/6	SW/T*	—
Sitting/Recovery	3/6	SW/T*	—
Staff Base	5/6	S/T	—
Staff Changing	5	TF	VA
Store	5	TF	VA
Treatment	3	SW	—
WC	2	SW	—

Adult acute - Nursing section

Department/ Activity Space	Category	Group	Preferred Finish
Bathroom	4	ESR	PVC
Circulation Space	5/6	S/T*	—
Cleaners Room	2	SW	—
Clean Room	3	SW	—
Cloak Room	5	TF	VA
Day Room	5/6	S/TF/T*	T4
Dining Room	5/6	S/TF/T*	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Flower Bay	5/6	S/T*	—
Linen Bay	5/6	S/T*	—
Multi-bed Room	3/6	SW/T*	—
Office	5/6	S/TF/T	T4
Pantry	2	SW	—
Relatives Room	6	T	T3
Seminar	5/6	S/TF/T	T4
Shower	4	ESR	PVC
Single-bed Room	3/6	SW/T*	—
Staff Base	5/6	S/T*	—
Store	5	TF	VA
Switch Room	5	TF	VA
Treatment Room	3	SW	—
WC	2	SW	—
Wheelchair Park	5/6	S/T*	—

Department/ Activity Space	Category	Group	Preferred Finish

Ambulance

Circulation Space	5	S/TF	VA
Cleaners Room	2	SW	—
Control Room	5/6	S/TF/T	—
Drying Room	2	SW	—
Garage Area	3	ISU	—
Kitchen	2	SW	—
Mess Room	5/6	S/TF/T	—
Office	5/6	S/TF/T	T4
Shower	4	ESR	PVC
Sluice Room	4	ESR	C
Staff Changing	5	TF	VA
Store	5	TF	VA
WC	2	SW	—

Boiler house

Boiler Room	3/5	TRCJ/ ISU/IS	—
Calorifier Room	3/5	TRCJ/ ISU/IS	—
Circulation Space	5	ISU	—
Fuel Store	5	ISU	—
Staff Accommodation	5	TF	VA
Staff WC and Washroom	2	SW	—
Switch Room	5	ISU	—

Children – Day patient accommodation

Circulation Space	5/6	S/TF/T*	—
Clean Utility	3	SW	—
Dirty Utility/ Disposal	2	SW	—
Multi-bed Room	3/6	SW/T*	—
Pantry	2	SW	—
Single-bed Room	3/6	SW/T*	—
Treatment/ Examination	3	SW	—
Waiting/Play	5/6	S/TF/T*	—
WC	4	ESR	PVC

Department/ Activity Space	Category	Group	Preferred Finish

Children – In-patient accommodation

Bathroom	4	ESR	PVC
Circulation Space	5/6	S/TF/T*	—
Clean Utility	3	SW	—
Dirty Utility	2	SW	—
Flower Bay	5/6	S/TF/T*	—
Linen Store	5/6	S/TF/T*	—
Multi-bed Room	3/6	SW/T*	—
Office	5/6	S/TF/T	T4
Pantry	2	SW	—
Play/Dining/ Education	5/6	S/TF/T*	—
Shower	4	ESR	PVC
Single-bed Room	3/6	SW/T*	—
Staff Base	5/6	S/TF/T*	—
Store	5	TF	VA
WC	2	SW	—

Children – Shared accommodation

Admission/ Examination	3/6	SW/T*	—
Adolescent's Day Room	5/6	S/TF/T*	—
Baby Feed Store	5	TF	—
Circulation Space	5/6	S/TF/T*	—
Cleaners Room	2	SW	—
Disposal	2	SW	—
Education Space	5/6	S/TF/T*	—
Equipment Bay	5/6	S/TF/T*	—
Office/Interview	5/6	S/TF/T*	—
Parents Bedroom	6	T	T4
Parents Sitting Room	6	T	T4
Seminar	5/6	S/TF/T*	—
Shower	4	ESR	PVC
Staff Changing	5	TF	VA
Staff Locker Room	5	TF	VA
Switch Room	5	TF	VA
Teachers Base	5/6	S/TF/T*	—
Treatment	3	SW	—
WC	2	SW	—

Dental

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	5/6	S/TF/T	—
Laboratory and Dark Room	3	SW	—
Office	5/6	S/TF/T	T4
Recovery Room	3	SW	—
Store	5	TF	VA
Surgery	3	SW	—
Switch Room	5	TF	VA
Waiting Area	5/6	S/T	—
WC	2	SW	—

Dining room

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	5/6	S/TF/T	—
Cleaners Room	2	SW	—
Cloak Room	5/6	S/TF/T	—
Coffee Room	6	T	T5
Dining Room	5/6	S/TF/T*	—
Office	5/6	S/TF/T	T4
Sandwich Room	5/6	S/TF/T	—
Servery	2	TREJ	C
Staff Changing Room	5	TF	VA
Store	5	TF	VA
WC	2	SW	—

Educational accommodation

Department/ Activity Space	Category	Group	Preferred Finish
Audio-visual	6	T	T5
Classroom	5/6	S/TF/T	—
Common Room	6	T	T5
Demonstration	5/6	S/TF/T	—
Dining	5/6	S/TF/T	—
Entrance/ Reception/ Waiting Area	5/6	S/TF/T	T5
Lecture/Seminar/ Discussion	5/6	S/TF/T	—
Library	6	T	T4
Office	5/6	S/TF/T	T4
Servery	2	ESR	PVC
Staff Room	6	T	T4
Store	5	TF	VA
WC	2	SW	—

Fracture clinic

Department/ Activity Space	Category	Group	Preferred Finish
Appliance Fitting Room	3	SW	—
Clean Supplies & Preparation	3	SW	—
Cleaners Room	2	SW	—
Consulting/ Examination Room	3/6	SW/T*	—
Circulation Space	5/6	S/T	—
Dirty Utility	2	SW	—
Disposal Holding	2	SW	—
Plaster Room	3	SW	—
Reception, Sub-waiting and Wheelchair Park	5/6	S/T	—
Store	5	TF	VA
WC	2	SW	—

Geriatric care - Day hospital

Department/ Activity Space	Category	Group	Preferred Finish
Bathroom	4	SER	PVC
Bedroom	6	T*	T4
Circulation Space	3/6	SW/T*	—
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Clothes Hanging/ Waiting/ Wheelchair Park	3/6	SW/T*	—
Consulting/ Examination Room	3	SW	—
Dining	3	SW	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
General Sitting Space	3/6	SW/T*	—
Interview Room	6	T*	—
Kitchen	2	SW	—
Occupational Therapy	3/6	SW/T*	—
Office	5/6	S/TF/T	T4
Pantry	2	SW	—
Physiotherapy	3/6	SW/T*	—
Quiet Room	3/6	SW/T*	—
Shower	4	ESR	PVC
Staff/Seminar Room	6	T	T4
Speech Therapy/ Consultants/ Examination Room	6	T*	—
Staff Cloak Room	5	TF	VA
Store	5	TF	VA
Switch Room	5	TF	VA
Treatment Room	3	SW	—
Utility/ Laundry	4	ESR	—
WC	2	SW	—

Geriatric care - Nursing section

Department/ Activity Space	Category	Group	Preferred Finish
Bathroom	4	ESR	PVC
Bathroom/ Treatment	4	ESR	PVC
Circulation Space	3/6	SW/T*	—
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Cloak Room	5	TF	VA
Day Room	3/6	SW/T*	—
Dining Room	3	SW	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Flower Bay	3/6	SW/T*	—
Linen Bay	3/6	SW/T*	—
Multi-bed Room	3/6	SW/T*	—
Occupational Therapy	3/6	SW/T*	—
Office	5/6	TF/T	T4
Pantry	2	SW	—
Physiotherapy	3/6	SW/T*	—
Relatives Room	6	T	T3
Seminar	5/6	S/TF/T	T4
Shower	4	ESR	PVC
Single-bed Room	3/6	SW/T*	—
Staff Base	3/6	SW/T*	—
Store	5	TF	VA
Switch Room	5	TF	VA
Waiting Area	3/6	SW/T*	—
WC	2	SW	—
Wheelchair Park	3/6	SW/T*	—

Health centre

Department/ Activity Space	Category	Group	Preferred Finish
Child Assessment	5/6	TF/T*	T4
Chiropody	3	SW	—
Circulation Space	5/6	S/TF/T	T5
Cleaners Room	2	SW	—
Consulting/ Examination Room	3/6	SW/T*	—
Consulting Room - Audiology	6	T	T4
Dental Surgery	3	SW	—
Dispensary	3	SW	—
Disposal	2	SW	—
Health Education	5/6	S/TF/T	T4
Interview Room	6	T	T4
Kitchen/Teabar	3	SW	—
Laboratory and Dark Room	3	SW	—
Nurses Service Room	5	TF	VA
Office	5/6	S/TF/T	T4
Pharmacy	3	SW	—
Physiotherapy	3/6	SW/T	—
Physiotherapy - (Utility Area)	3	SW	—
Playroom	5/6	S/TF/T*	—
Pram Shelter (inside)	3/5	SW/ TRCJ	—
Recovery Room	3	SW	—
Seminar/Library	5/6	S/TF/T	T4
Speech Therapy	6	T	T4
Staff Common Room	6	T	T4
Store	5	TF	VA
Switch Room	5	TF	VA
Treatment	3	SW	—
WC	2	SW	—

Intensive therapy unit

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	3	SW	—
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Laboratory	3	SW	—
Multi-bed Room	3	SW	—
Office	5/6	TF/T	T4
Pantry	2	SW	—
Relatives Room/ Doctors Room/ Overnight Stay	6	T	T3
Single-bed Room	3	SW	—
Staff Base	3	SW	—
Staff Changing	5	TF	VA
Staff Rest Room	5/6	TF/T	T4
Store	5	TF	VA
Switch Room	5	TF	VA
WC	2	SW	—

Kitchen

Department/ Activity Space	Category	Group	Preferred Finish
Bulk Provisions Store	2	TREJ/IS	C
Central Beverage Preparation Space	2/4	TREJ/IS	C
Central Cooking	2/4	TREJ/ ESR	—
Central Tray Preparation Space	4	ESR	C
Central Tray Service Space	4	ESR	C
Central Wash-up	4	ESR	C
Cleaners Room	5	TRCJ	—
Cooling Room or Larder	2	TREJ	C
Day to Day Store	2	TREJ	C
Diet Preparation	4	ESR	C
Disposables Store	5	TRCJ	—
Equipment Store	5	TRCJ	—
Fish Storage		Special	
General Preparation	4	ESR	C
Kitchen Cold Room		Special	
Kitchen Deep Freeze		Special	
Meat Cold Store		Special	
Office	5	TF	—
Pan Wash	4	ESR	C
Pastry and Sweets Preparation	4	ESR	C
Raw Meat and Fish Preparation	4	ESR	C
Sandwich Preparation	4	ESR	C
Staff Changing	5	TF	VA
Staff Rest Room	5/6	TF/T	—
Trolley Parking Space	2/5	SW/TF/ TRCJ	—
Trolley Wash	4	ESR	C
Vegetables, Salads & Fruit Preparation	4	ESR	C
Vegetable Store	2	TREJ	C
Washing Up Materials Store	5	TRCJ	—
WC/Washroom	2	SW	—

Laundry

Department/ Activity Space	Category	Group	Preferred Finish
Assembling, Parking & Despatch	5	TRCJ	—
Barrier Room	3	SW	—
Colandering	3	SW	—
Calorifier	5	TRCJ	—
Central Disinfection Area	4	ESR	—
Classification	3	SW	—
Cleaners Room	2	SW	—
Drying	4	ESR	—
Machine Cloth Store	5	TF	VA
Mess Room	5/6	TF/T	VA
Office	5/6	TF/T	—
Plant Room	5	TF/TRCJ	—
Pressing	3	SW	—
Reception	3	SW	—
Rest Room	5/6	TF/T	T4
Solution Preparation/ Storage Area	4	ESR	—
Store	5	TF	VA
Switch Room	5	TF	VA
Washing	4	ESR	—
Washing Materials Store	5	TF	VA
WC	2	SW	—

Maternity - Adminstration

Circulation	5/6	TF/T	T5
Classroom	5/6	TF/T	T4
Disposal	2	SW	—
Office	5/6	TF/T	T4
Staff Cloaks	5	TF	VA
Store	5	TF	VA
WC	2	SW	—

Maternity - Central delivery suite

Department/ Activity Space	Category	Group	Preferred Finish
Abnormal Delivery Room	1	AS	—
Admission Suite	3	SW	—
Bathroom	4	ESR	—
Changing Room	5	TF	VA
Circulation Space	3	SW	—
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Day Room	5/6	TF/T	T4
Delivery Room	3	SW	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Equipment Store	5	TF	VA
Linen Room	5	TF	VA
Office	5/6	S/TF/T	T4
Pantry	2	SW	—
Scrub-up and Gowning	4	ESR	—
Shower	4	ESR	PVC
Staff Base	3	SW	—
Trolley Space	3	SW	—
WC	2	SW	—

Maternity - Nursing section

Department/ Activity Space	Category	Group	Preferred Finish
Assisted Shower/ WC/Wash	4	ESR	PVC
Baby Feed/ Demonstration Room	2	SW	—
Bathroom	4	ESR	—
Circulation Space	5/6	S/T	—
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Day/Dining Room	5/6	TF/T*	—
Dirty Utility	2	SW	—
Disposal Room	2	SW	—
Equipment Store	5	TF	VA
Flower Bay/ Linen Store	5/6	S/T*	—
Multi-bed Room	3/6	SW/T*	—
Nursery	3	SW	—
Office	5/6	TF/T	T4
Pantry	2	SW	—
Seminar Room	5/6	TF/T	T4
Single-bed Room	3/6	SW/T*	—
Staff Base	5/6	S/T	—
Staff Changing	5	TF	VA
Switch Room	5	TF	VA
WC	2	SW	—

Maternity - Special care baby unit and central baby feed kitchen

Department/ Activity Space	Category	Group	Preferred Finish
Bedroom	3/6	SW/T	—
Beverage Point - Baby Feed Demonstration	3	SW	—
Blood Gas Analysis Room	3	SW	—
Central Milk Kitchen	3	SW	—
Circulation Space	3	SW	—
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Day Room and Play Room	5/6	TF/T*	T4
Dirty Utility	2	SW	—
Disposal	2	SW	—
Entrance, Visitors Gowning	3	SW	—
Incubator Nursery	3	SW	—
Linen Room	5	TF	VA
Nursery	3	SW	—
Office/Interview/ Seminar Room	5/6	S/TF/T	T4
Reception, Breast Milk	3	SW	—
Shower	4	ESR	PVC
Staff Base	3	SW	—
Staff Changing	5	TF	VA
Store	5	TF	VA
Switch Room	5	TF	VA
WC	2	SW	—

Medical photography and illustration

Department/ Activity Space	Category	Group	Preferred Finish
Changing cubicle	5/6	TF/T	T4
Circulation Space	5/6	S/TF/T	T5
Cleaners Room	2	SW	—
Dark Room	3	SW	—
Display	3	SW	—
Editing	3	SW	—
Finishing Room	3	SW	—
Office	5/6	S/TF/T	T4
Reproduction and Copying Room	3	SW	—
Staff Room	6	T	T4
Store	5	TF	VA
Studio	3	SW	—
WC	2	SW	—

Mental illness - Day hospital

Department/ Activity Space	Category	Group	Preferred Finish
Art Room	3	SW	—
Beauty/ Hairdressing	3	SW	—
Behavioural Therapy	3/6	SW/T	—
Circulation Space	5/6	S/T	—
Cleaners Room	2	SW	—
Cloak Room	5	TF	VA
Dining Room	5/6	S/TF/T*	—
Disposal Room	2	SW	—
Games Room	5	S/TF	—
Group Therapy/ Library/Music/ Quiet/Sitting	6	T	T4
Heavy Workshop	5	S/TRCJ	—
Hobbies Room	5/6	S/TF/T	—
Horticulture	3	ISU/TRCJ	—
Interview Room	6	T	T4
Kiln Room	3	ISU/TRCJ	—
Kitchen	2	SW	—
Laundry	4	ESR	PVC
Light Workshop	5	S/TF	VA
Observation Room	6	T	T4
Office	5/6	S/TF/T	T4
Patients Washroom	2	SW	—
Pottery Room	3	ISU/TRCJ	—
Recreation Store	5	TF	VA
Servery	2	SW	—
Sitting	6	T	T5
Staff/Seminar Room	6	T	T4
Store	5	TF	VA
Switch Room	5	TF	VA
Timber Store	3	ISU	—
Treatment/Clean Utility	3	SW	—
WC	2	SW	—

Mental illness - ECT

Ante-Room	5/6	S/TF/T	T4
Circulation Space/ Reception	5/6	S/TF/T	T5
Disposal Room	2	SW	—
Recovery Room	3	SW	—
Store	5	TF	VA
Treament Room	3	SW	—
Washroom, Assisted WC	2	SW	—

Mortuary and post mortem

Department/ Activity Space	Category	Group	Preferred Finish
Attendants Room	3/6	SW/T	—
Bier Room	2/4	ESR/ TREJ/IS	—
Body Store/ Trolley Bay	2/4	ESR/ TREJ/IS	—
Circulation Space	2/4	ESR/ TREJ/IS	—
Cleaners Room	2	SW	—
Clean Stock	3	SW	—
Compressor and Switch Room	5	TF	VA
Instruments	3	SW	—
Linen Room	5	TF	VA
Medical Observation Room	3	SW	—
Office	5/6	TF/T	—
Pathologists Changing Room	3	SW	—
Post Mortem Room	2/4	ESR/ TREJ/IS	—
Refrigerate Chambers		Special	
Shower	4	ESR	—
Sluice	2/4	ESR/ TREJ/IS	—
Specimen Room	3	SW	—
Viewing Cubicle	3	SW	—
Viewing Room	5/6	S/T	T4
Visitors Entrance	3/6	S/T	T4
Waiting Room	3/6	S/T	T4
WC	2	SW	—

Department/ Activity Space	Category	Group	Preferred Finish

Operating

Anaesthetic Room	1	AS	—
Beverage Bay	3	SW	—
Central Store	3	SW	—
Changing Room	3	SW	—
Circulation Space	3	SW	—
Clean Corridor	3	SW	—
Clean Utility	3	SW	—
Dirty Utility	2	SW	—
Disposal, Holding or Collection	2	SW	—
Entrance/ Reception/ Transfer Area	3	SW	—
Equipment Store	3	SW	—
Exit Bay	3	SW	—
Office	3	SW	—
Operating Theatre	1	AS	—
Outer Corridor	2	SW	—
Plaster Room	2	SW	—
Post Operative Recovery Area	2	SW	—
Preparation	2	SW	—
Scrub-up	4	ESR	—
Shower	4	ESR	—
Staff Control Base	3	SW	—
Staff Rest Room	3/6	SW/T*	—
Switch Room	5	TF	VA
WC	2	SW	—
X-ray Processing	3	SW	—

Out-patient – Children

Circulation Space	5/6	S/T	T5
Consulting/ Examination	3/6	SW/T*	—
Dirty Utility	2	SW	—
Mother & Baby Room	3/6	SW/T*	—
Office	5/6	TF/T	T4
Pram/Wheelchair Area	5/6	S/T	—
Treatment Room	3	SW	—
WC	2	SW	—
Weighing/ Measuring Room	2	SW	—

Department/ Activity Space	Category	Group	Preferred Finish

Out-patient – Childrens Comprehensive Assessment Type A

Assessment/ Observation/ Remedial/Therapy/ Treatment Rooms	3	SW	—
Office/Seminar	5/6	TF/T	—
Store	5	TF	VA
Viewing	3/6	SW/T*	—
Waiting/Dining Room	5/6	S/T*	—

Type B

Assessment/ Observation/ Remedial/Therapy/ Treatment Rooms	3	SW	—
Circulation Space	5/6	S/T	T5
Consulting/ Examination	3/6	SW/T*	—
Dirty Utility	2	SW	—
Office	5/6	TF/T	T4
Office/Seminar	5/6	TF/T	T4
Pram Store/ Wheelchair Park	3/5	SW/ TRCJ	—
Staff Locker Room	5	TF	VA
Store	5	TF	VA
Switch Room	5	TF	VA
Viewing Room	3/6	SW/T*	—
Waiting/Dining Room	5/6	S/T*	—
WC	2	SW	—

Out-patient – General

Department/ Activity Space	Category	Group	Preferred Finish
Consulting/ Examination Room	3/6	SW/T*	—
Changing Cubicle	5/6	S/T	—
Circulation Space	5/6	S/T	T5
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Office	5/6	TF/T	T4
Ophthalmic Room	3/6	SW/T	—
Porters Room	5/6	S/T	T4
Reception	5/6	S/T	T5
Store	5	TF	VA
Test Room	3	SW	—
Treatment Room	3	SW	—
Trolley and Wheelchair Area	5/6	S/T	—
WC	2	SW	—

Out-patient – Mental illness

Department/ Activity Space	Category	Group	Preferred Finish
Assisted Washroom & WC	4	ESR	—
Circulation Space	5/6	S/T	T5
Cloak Room – Patients	5	TF	VA
Consulting/ Examination	3/6	SW/T	T4
Dirty Utility/ Disposal	2	SW	—
Interview Room	6	T	T4
Medical Records	5/6	TF/T	VA
Office	5/6	S/TF/T	T4
Psychological Testing Room	3/6	SW/T	—
Staff Changing	5	TF	VA
Store	5	TF	VA
Treatment/ Clean Utility	3	SW	—
WC	2	SW	—

Out-patient – Ophthalmic

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	5/6	S/T	T5
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Consulting/ Examination Room	5/6	S/TF/T	T5
Dark Room	3	SW	—
Dirty Utility	2	SW	—
Dispensing Optician	5/6	S/TF/T	T4
Fluorescein Angiography	5/6	S/TF/T	T5
Office	5/6	S/TF/T	T4
Orthoptist	3/6	SW/T	—
Staff Base	5/6	S/TF/T	T5
Locker Room	5	TF	VA
Store	5	TF	VA
Switch Room	5	TF	VA
Treatment Room	3	SW	—
Waiting/ Recovery Area	5/6	S/TF/T*	—
WC - Patients	2	ESR	PVC
WC - Staff	2	SW	—

Pathology

Department/ Activity Space	Category	Group	Preferred Finish
Blood Bank	3	SW	—
Centrifuge Room	3	SW	—
Circulation Space	3/5	S/TF	—
Cleaners Room	2	SW	—
Cloak Room	5	TF	VA
Disposal Room	2	SW	—
Examination Room	3	SW	—
Hot/Cold Room	3	SW	—
Laboratory	3	SW	—
Media Room	3	SW	—
Mounting/ Preparation	3	SW	—
Museum	3	SW	—
Office	5/6	S/TF/T	T4
Staff Room	6	T	T4
Sterilising Room	3	SW	—
Store	5	TF	VA
Waiting Area	5/6	S/TF/T	T4
Wash-up	3	SW	—
WC	2	SW	—
Workshop	5	TF	VA

Pharmacy

Department/ Activity Space	Category	Group	Preferred Finish
Advisory Cubicle	5/6	S/TF/T	T4
Aseptic Filling	2	SW	—
Aseptic Room	2	SW	—
Balance Room	3	SW	—
Bottle Preparation	4	ESR	—
Changing Room/ Robing/Inter-change Area	2	SW	—
Chemicals Store	3	SW	—
Circulation Space	3	SW	—
Cleaners Room	2	SW	—
Cloak Room	5	TF	VA
Container Preparation	2	SW	—
Containers - clean	3	SW	—
Dispensary	3	SW	—
Dressing Store	3	SW	—
Drug Information Library	5/6	S/TF/T	—
Emergency Store	5	TF	VA
Equipment Cleaning	2	SW	—
Finished Products Store	5	TF	VA
Finished Products Quarantine Store	5	TF	VA
Flammable Store		Special	
Goods Reception	5	TF	VA
Incubation	3	SW	—
Incoming Materials (Quarantine)	5	TF	VA
Inspection/Label/ Preparation/ Labelling	3	SW	—
Laboratory	3	SW	—
Laundry Facility	4	ESR	—
Materials Store	5	TF	VA
Media Kitchen	3	SW	—
Medical Gas Cylinder Store	5	TRCJ/ ISU	—
Microbiological Media Store	3	SW	—
Office	5/6	S/TF/T	T4
Packaging and Overwrap	5	TF	VA
Ward Service Area	3	SW	—
WC	2	SW	—

Department/ Activity Space	Category	Group	Preferred Finish
Patient Waiting	5/6	S/TF/T	T4
Porters Room/ Base	5/6	S/TF/T	T4
Preparation/ Filling Area	2	SW	—
Preparation Room	2	SW	—
Reference Samples Store	5	TF	VA
Repackaging	5	TF	VA
Reusable Container Collection	5	TF	VA
Security Store	5	TF	VA
Seminar	5/6	S/TF/T	T4
Staff Entrance	5/6	S/TF/T	—
Sterilisation	3	SW	—
Still Room	3	SW	—
Store	5	TF	VA
Trolley and Equipment Park	5	TF	VA

Radiodiagnostic

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	5/6	S/TF/T	T5
Cleaners Room	2	SW	—
Clean Utility	3	SW	—
Dark Room	3	SW	—
Dirty Utility	2	SW	—
Disposal	2	SW	—
Dressing Cubicle	5/6	S/TF/T	—
Lavage Room	4	ESR	PVC
Linen	5	TF	VA
Mobile X-ray Store	5	S/TF	—
Office	5/6	S/TF/T	T4
Radiodiagnostic Room	3	SW	—
Radiographer	5/6	S/TF/T	T4
Records	5/6	S/TF/T	—
Recovery Room	3	SW	—
Staff Room	6	T	T4
Store	5	TF	VA
Trolley Space	5/6	S/TF/T	—
Ultrasound	3	SW	—
Viewing and Sorting Room	3	SW	—
WC	2	SW	—

Rehabilitation

Department/ Activity Space	Category	Group	Preferred Finish
Apparatus Bay	5	S/TF	—
Apparatus Bay – Hydrotherapy	4	ESR	—
Apparatus Store	5	S/TF	—
Bathroom	4	ESR	—
Bedroom	6	T	T3
Changing Cubicle – Gymnasium	5/6	S/TF/T	—
Changing Cubicle – Hydrotherapy	4	ESR	—
Changing Cubicle – Treatment	5/6	S/TF/T	—
Circulation Space	5/6	S/TF/T	T5
Cleaners Room	2	SW	—
Clinical Room	3	SW	—
Consulting/ Examination Room	3/6	SW/T	—
Disposal Room	2	SW	—
Electronyography Room	3/6	SW/T	—
Gymnasium		Special	
Heavy Workshop	3	ISU	—
Hydrotherapy	4	ESR	—
Individual Open Exercise Area	5/6	S/TF/T	—
Interview Room	6	T	T4
Kitchen	3	SW	—
Laundry	4	ESR	—
Light Workshop	5	TF	VA
Main Waiting	5/6	S/TF/T	T4
Patients Shower	4	ESR	PVC
Plaster and Plaster Splints	3	SW	—
Porters Base	5/6	S/TF/T	T4
Preparation Bay	5	S/TF	—
Reception/ Records/Office	5/6	S/TF/T	T4
Recovery Room	5/6	S/TF/T	—
Speech Therapy	6	T	T4
Staff Changing	5	TF	VA
Staff Changing Cubicle – Hydrotherapy	4	ESR	—
Staff Room/ Seminar	6	T	T4
Store	5	TF	VA
Switch Room	5	TF	VA
Timber/Materials Store	3	ISU	—
Treatment Cubicle	3/6	SW/T	—
Wax Treatment Room	3	SW	—
WC	2	SW	—
Wheelchair Bay	5/6	S/TF/T	—

Residential accommodation

Department/ Activity Space	Category	Group	Preferred Finish
Bathroom	3	SW	—
Bedroom	6	T	T3
Bed-Sitting Room	6	T	T4
Circulation Space	6	T	T4
Cleaners Room	2	SW	—
Cloak Room	5	TF	VA
Common Room	6	T	T4
Kitchen	3	SW	—
Living Room	6	T	T4
Office	5/6	S/TF/T	T4
Shower	4	ESR	PVC
Sitting Room	6	T	T4
Utility Store	5	TF	VA
WC	2	SW	—

Secure unit

Department/ Activity Space	Category	Group	Preferred Finish
Bathroom	4	ESR	—
Circulation Space	5/6	S/TF/T	T4
Classroom	3	SW	—
Clinical/ Examination Room	3	SW	—
Cleaners Room	2	SW	—
Communal Area	5/6	S/TF/T	T4
Duty Room	5/6	S/TF/T	T4
Group Therapy Room	6	T	T4
Gymnasium		Special	
Interview/ Conference	6	T	T4
Kitchen	2	SW	—
Launderette/ Utility Room	4	ESR	—
Library	5/6	S/TF/T	T4
Linen	5	TF	VA
Office	5/6	S/TF/T	T4
OT Hobbies Room	5	S/TF	VA
Quiet Room	6	T	T4
Secure Room	3	SW/IS	—
Shower	4	ESR	—
Single-bed Room	3/6	SW/T	—
Staff Rest Room	6	T	T4
Store	5	TF	VA
Study Room	5/6	S/TF/T	T4
Training Room	5/6	S/TF/T	—
Visitors Room	6	T	T4
WC	2	SW	—

Sterilising and disinfecting unit

Department/ Activity Space	Category	Group	Preferred Finish
Circulation space	3	SW	—
Cleaners Room	2	SW	—
Disposal Collection	2	SW	—
Disposal Holding Area	2	SW	—
Materials Holding Store	5	TF	VA
Medical Equipment Test Area/Service/ Work Area	3	SW	—
Office	5	S/TF	—
Reception – Clean Supply	3	SW	—
Reception – Soiled Goods	3	SW	—
Staff Changing	5	S/TF	—
Staff Room	5/6	TF/T	—
Sterile Goods Store	3	SW	—
Sterilizer Working Area	3/5	SW/ TRJC/IS	—
Trolley Unloading/ Maintenance Area	3/5	SW/ TRJC/IS	—
Trolley Wash	4	ESR	—
Wash Room	4	ESR	—
WC	2	SW	—
Work Area	3	SW	—

Street

Department/ Activity Space	Category	Group	Preferred Finish
Circulation	5/6	S/TF/T*	T5
Sub-Waiting	5/6	S/TF/T*	—
Stairs	5/6	S/TF/T*	—
Lift Lobby	5	S/TF	—
Disposal Room	2	SW	—

Main Entrance

Department/ Activity Space	Category	Group	Preferred Finish
Entrance Lobby	5/6	S/T	T5
Entrance Foyer/ Waiting	5/6	S/T*	T5
Quiet Room	5/6	S/T*	T5
Reception/ Enquiries	5/6	S/TF/T	T4
Shop	4	ESR	—
Store	5	TF	VA
Office	5/6	S/TF/T	T4
Admissions	5/6	S/TF/T	T4
Duty Room	5/6	S/TF/T	T4

Works unit

Department/ Activity Space	Category	Group	Preferred Finish
Circulation Space	5	TF	VA
Office	5/6	TF/T	—
Staff Accommodation	5/6	TF/T	—
Staff Changing	5	TF	VA
Store	3	ISU	—
WC	2	SW	—
Workshop	3	ISU	—

Younger disabled unit

Department/ Activity Space	Category	Group	Preferred Finish
Bathroom	4	ESR	—
Bedroom	3/6	SW/T	T4
Circulation Space	5/6	S/TF/T	T5
Clean Utility	3	SW	—
Cleaners Room	2	SW	—
Clinical/ Examination	3	SW	—
Day Space	6	T	T5
Dining Room	5/6	S/TF/T	—
Dirty Utility	2	SW	—
Hobbies Room	5	TF	VA
Office	6	T	T4
Pantry	2	SW	—
Quiet Room	6	T	T4
Shower	4	ESR	—
Store	5	TF	VA
Visitors Room	6	T	T4
WC	2	SW	—

Physical and Performance Characteristics	Categories of Performance 1	2	3	4	5	6
	hard finish	hard finish	hard finish	hard finish	hard finish	soft finish
Impervious	●	●	●	●	●	★
Jointless	●	●	●	●		●
Smooth	●	●	●		●	
Anti-static	●					
Extra slip resistant				●		
Low liquid absorption						●
Low radius of ignition						●
Low dirt retention						●
Patterned						●
Cleaning Routine A	●					
B		●		●		
C			●		●	
D			●		●	
E						●

soft finishes need to be impervious only in the activity spaces listed in Appendix A which are marked with an asterisk * to indicate that wet spillage is likely.

Category	Ref	Group	Finish
1	AS	Anti-static	Anti-static: pvc sheet: welded joints Anti-static: pvc tiles: welded joints Anti-static: terrazzo tiles: cement based Anti-static: in-situ terrazzo: cement based Anti-static: resin based
2	SW	Sheet: welded joints	pvc pvc resilient backed linoleum
	TREJ	Tile: rigid epoxy joints	ceramic terrazzo: cement based
	IS	In-situ	terrazzo: cement based resin based
3	SW	Sheet: welded joints	pvc pvc resilient backed linoleum
	IS	In-situ	terrazzo: cement based resin based
	ISU	In-situ: utilitarian	concrete granolithic
4	ESR	Extra slip resistant	non-slip pvc sheet: welded joints ceramic tiles: epoxy joints non-slip resin based
5	S	Sheet	pvc pvc resilient backed linoleum
	TF	Tile: flexible	pvc linoleum semi-flexible pvc
	TRCJ	Tile: rigid cement joints	ceramic terrazzo: cement based clay floor quarries
6	T	Textile	woven tufted bonded flocked fibre bonded (needle punch)

Coded references to preferred floor finishes

C: Ceramic
PVC: Polyvinyl Chloride
VA: semiflexible pvc

T: Textile –

	Woven, Tufted Bonded, Flocked Rating	Fibre Bonded Grade
T3:	C	3
T4:	B	4
T5:	A	5

B National Building Specification clauses

N B S is a library of standard specification clauses, covering most kinds of building work and comprises a wide range of clauses, with accompanying guidance notes. All clauses are optional and their combination into a job specification is left to the specifier. N B S has great flexibility and it can be adapted to suit the technical needs and preferences of different projects, organisations and specifiers.

Specifications go out of date as a result of technical innovation or major review of a key BSI document. As N B S sections become affected by such major changes they are re-issued to members of the subscription service. Users are advised to ensure that they refer to the current edition.

The Sections listed in this Appendix relate to the Full Version of the N B S. In addition a Small Jobs Version is available which maintains the essential principles of the N B S but offers a limited selection of clauses.

N B S Sections are set out in an easily scanned sequence and the following are applicable to flooring:

Screeds/Toppings
Stone/Concrete/Clay Tile/Slab Flooring/Paving
Terrazzo
Carpeting/Carpet Tiling
Rubber/Plastics/Cork/Linoleum Sheeting/Tiling

The above sections can be purchased from:

NBS Services Ltd.,
Mansion House Chambers,
The Close,
Newcastle upon Tyne, NE1 3RE.

C Slip resistance

In normal walking the shoe exerts various horizontal forces on the surface with which it comes into contact. The relationship between these forces and vertical ones resulting from the surface texture of the contacting surfaces is described as the co-efficient of friction. This can vary from one material to another and even with the same material it can be affected by the presence of water.

The results of tests using a simulated rubber shoe and a variety of floor finishes are set out in Table 3 of BS 5395, Code of Practice for Stairs. In these tests the floor finish was unpolished, and separate test results are given for the finishes being both dry and wet.

Results are tabulated thus in Table 3:

Coefficient of friction	Grading	Application
Less than 0.2	Very poor	Unsafe surfaces
0.2 to less than 0.4	Poor to fair	Surfaces below acceptable safety limits
0.4 to less than 0.75	Good	Surfaces satisfactory for normal use
0.75 and over	Very good	Surfaces suitable for areas where special care is required

Publications relating to the subject are listed below:

1 National Building Studies Research Paper No. 32(1967) – The forces applied to the floor by the foot in walking.
2 Greater London Council Development and Materials Bulletin No. 43 (Second Series) 1971
No. 57 (Second Series) 1972.
No. 123 (Second Series) 1979.
3 BS 5395: 1977 Code of Practice for Stairs.

D Testing and research

Testing

Published methods of testing installed flooring and flooring materials are limited and somewhat unrelated.

Tests for physical properties are confined to materials only and take no account of the installed floor.

Current publications containing methods of test or assessment are:

BS 3261 Unbacked flexible pvc flooring
BS 1881 Testing concrete
BS 4551 Methods of testing mortars, screeds and plasters

BRE
CP 72/78 A method of assessing the soundness of some dense floor screeds
IP11/84 BRE Screed Tester: Classification of screeds, sampling and acceptance limits.

None of these tests include methods of assessing either the load bearing capacity of flooring, or the resistance of flooring to heavy mobile equipment.

Due to relatively frequent occurrence and severity of flooring failures, DHSS set up a programme of research by consultants into the likely physical performance of installed floors of various types.

This work has so far produced two laboratory tests to determine such performance:

Test F1

This test has been designed to assess load bearing characteristics taking account of static loads only.

The first part of this test method has been developed to provide a method of determining the bearing characteristics of hard flooring materials and assemblies.

The aim is to provide the user with a method by which can be determined the ability of flooring to withstand the effects of stationary equipment, furniture and other components, placed on the surface of the floor.

The test simulates the loading conditions experienced on site, where the loaded area is relatively small in comparison to the area of installed flooring.

The test consists of applying an increasing load, by means of a 10 mm dia. steel mandrel on to the surface of the material under test, until a penetration of 0.5 mm has been reached, recording the surface resistance of the material to this loading.

Test F2

This test has been developed to provide guidance on the effects that can be caused by the use of mobile equipment on flooring systems.

Although the development of this test was initially concerned with the effects of operating tables, it can equally be used to demonstrate the effects of any type of equipment on any kind of flooring material.

Method
The test is conducted by repeatedly trafficking a sample of flooring, with the wheels and/or castors from the mobile equipment, for a prescribed number of cycles.

The degree and rate of deterioration of the sample, can be measured against the level of use, type and weight of equipment, and location and frequency of use of equipment routes, to provide guidance on the likely durability of the selected material in service.

Research

Research projects which formed the background for the development of the foregoing tests, were carried out jointly by DHSS and NHS professional officers together with a firm of consultant architects.

The resulting reports were issued to Regional Architects in England, to the Chief Architects of Common Services Agency Scotland, Welsh Health Technical Services, and DHSS Northern Ireland.

The research projects can be summarised as follows:

Project 1: A study of floors in operating theatres
This research was undertaken as a result of the increasing number of failures occurring in operating theatre floors. The study took the form of a detailed survey of some 87 operating theatres in 43 hospitals with a view, as the first stage, to determine the extent and nature of the problem.

The survey was based on a random sample of floors which was structured to include all commonly used floors, floors with known problems and floors which had performed successfully.

The following floor finishes were examined:

- in-situ terrazzo cement based
- terrazzo tiles cement based
- terrazzo epoxy based
- terrazzo neoprene based
- 2.0 mm pvc tile
- 3.2 mm pvc tile

Project 2: A study of the effects on operating theatre floors of wheels and swivel castors fitted to mobile theatre tables.

This project was the first in a proposed programme of tests on flooring systems comprising tests on the dynamic effects of mobile operating tables, methods of assessing the debonding resistance of pvc and other similar sheet and tile floor systems, and site investigations to determine the dynamic forces on theatre flooring.

It was divided into two parts:
Part 1:
This part covered the evolution of a method of measuring the contact area between wheels and castors and a hard floor surface through a range

of loadings selected to cover all situations likely to be encountered in an operating theatre.

This method was applied to three wheel/castor types, fitted to a particular make of operating table commonly in use.

Part 2:
This part was concerned with an examination of the behaviour of a selection of flooring systems when subjected to the same loading conditions and range of surface pressures as applied under the first part of this project. The materials were ultimately loaded to destruction.

Project 3: Flooring in areas other than operating theatres
This comprised a small pilot study of site surveys, to determine whether there was cause for concern over the performance-in-use of flooring in circulation and other areas in hospitals.

The samples for this study were far too few to be able to draw firm conclusions, but the indications from the installations examined, suggested that flooring in the more general areas, was far from satisfactory, with a level of performance significantly below that of the operating theatres examined in Project 1.

Project 4: Mobility of operating tables
This research resulted from the desire to reduce significantly the very high castor/floor contact pressures resulting from the use of some operating tables, and following the measurements made during Project 2.

The project comprised measuring the forces required to move and keep in motion an operating table fitted with a number of alternative castor materials in order to determine whether a change in the castor material, but not in the castor size, could achieve a reduction in the pressure on the floor surface, whilst maintaining an acceptable level of table mobility.

This project was carried out in one of the theatres at Stoke Mandeville hospital, and the table manufacturers were represented during the site trials.

The study was seen as an interim measure to see if some improvements could be made both to equipment already in use and to equipment still in the design stage.

Project 5: The bearing strength of floor screeds and its method of measurement
This project was undertaken as a result of concern that had arisen as to the apparent conflict between the floor pressures resulting from operating tables, and what was commonly thought to be the compressive strength of floor screeds, ie the floor contact pressures from operating tables were in excess of the cube strength of most screeds.

The method adopted was to compare for a number of screed types:

A the results of Test F1 on samples comprising40 mm thickness laid under site conditions on 600 x 600 x 50 mm paving slabs with cube test results to BS 1881 preceding the laying of the sample.
B the results of Test F1 with the results of BRE CP 72/78 method of assessing soundness applied to the same samples.

The results of this study showed that there was a general trend of an increase in the bearing strength to be accompanied by an increase in cube strength, but there was no precise relationship between the two, and it was clear that the cube values could not be used to determine the bearing capacity of an installed floor.

The results of this project, in the form of scatter diagrams, are included in this appendix.

Main conclusions drawn from research projects
Copies of reports of the foregoing research projects are available from NHS Libraries, but the following main conclusions and points of guidance arising from these projects are set out below.

Mobile equipment
Operating tables fitted with small hard wheeled castors, (ie 50mm dia phenolic resin), are likely to cause erosion of the floor surface (terrazzo type materials), or debonding of sheet and tile flooring, (pvc and similar materials), within the expected life of the flooring. A combination of both these effects can also occur.

The phenolic resin wheels used in this research had an indentation hardness of 85 to 90 after 1 second, measured using a type D durometer, (US Standard ASTM D 1706).

The fitting of softer wheels of the same diameter, to the castors above, type D durometer hardness of 45 to 50 or less, is likely significantly to improve the life span of flooring, although problems can still occur, and several samples tested failed to survive the full span of the test.

Further improvements could be achieved by:
- Increasing the size of the castor wheels.
- Decreasing the weight of the operating table.
- Redesigning the suspension system of tables to achieve full contact with the floor surface, whilst making allowance for acceptable deviations in level of the floor surface.
- The fitting of even softer wheels than those mentioned above.

However softer wheels tend to reduce the mobility of the table, and tests would be required before such modifications could be carried out.

Floor finishes and screeds
No evidence has emerged from these research projects to suggest that a properly batched, mixed, laid and compacted cement/sand screed would be unsuitable for operating theatre application where mobile equipment will be used.

Cement and sand screeds were used for the bases for test samples in the floor trafficking tests and no problems were experienced. The screeds were laid on site by a screeding contractor.

The sample screeds sustained less than 1.0 mm indentation after four blows of the BRE screed soundness tester.

The results of the bearing strength tests on these samples, one of which is included in this appendix, were not substantially different from those obtained from a proprietary screed examined.

Site preparation and the quality of a screed installation are clearly of the greatest importance.

Finishes
The remarks made under mobile equipment cover the wear and tear aspects of theatre floor finishes, with the addition of the following:

Unless the user traffic will be light, with low point loads, avoid the selection of terrazzo type materials with soft matrix, sometimes advised for foot comfort reasons, as this can lead to the loss of the marble aggregate under high rolling loads, and resulting surface erosion.

The selection of marble aggregate is important in all terrazzos, as soft marble chips can be easily eroded and are likely to stain more easily.

Manufacturers recommended sealers should be considered as these help prevent staining, but care should be taken not to upset the electrical performance in an anti-static installation.

The bonding of thin terrazzo type materials to the sub-floor is important as poor bonding can accelerate surface erosion.

The blending of the marble aggregate in terrazzo, particularly synthetic types with a black matrix, is important and a mixture of small and large aggregate helps to provide a more even appearance.

The bonding and welding of pvc and other sheet and tile flooring systems, is highly critical, and is the major cause of problems in these floor types. It is possible, by tapping the surface of thin floor coverings, with a hard rounded object such as a tool handle, to determine areas where the surface is not bonded to the base. Such areas are likely to spread under the effects of heavy mobile equipment, and will also place an undue strain on the welded joint between the sheet or tile finish.

Debonded areas should be identified and rectified before the floor is put into use.

Screed surfaces that are open textured and/or friable, do not provide a satisfactory base for the application of a tile/sheet adhesive system.

Up-grading such surfaces with compounds etc, is not recommended.

Most pvc flooring requires that the screed surface be primed. Check that the manufacturers instructions are carried out, ensuring that the correct adhesive is used, the correct size of adhesive spreader is used, etc.

The quality of welding in pvc installations varies considerably.

Good quality welding, subjected to floor trafficking tests, has proved successful, even under high rolling loads, but poor quality welding is unlikely to survive even lightweight traffic.

A good weld will fill the routed groove at the junction of the floor finish, and be effectively fused to the pvc over the whole of the contacting surface.

Site examinations of welding often show that the welding rod has been fused in position too high, so that there is a cavity beneath the rod, formed by the routed groove. On completion, the weld is cut off flush with the floor surface, thus leaving a small bridge of welding over the routed groove, with very limited fusion at the sides only.

This quality of junction will have no resistance to small heavily loaded wheels which will press down on the surface of the weld causing the edge fusion to shear, and break the weld.

It is less easy to detect weak welding, before it has failed, but a visual examination at close quarters can often provide an indication.

Once the weld is stripped out it is quite easy to determine its quality, particularly if it can be examined in conjunction with the groove.

The ancillary components to pvc systems, such as skirtings, tend to be poorly designed in that it is often not possible to weld all junctions and produce an impervious membrane over the whole area.

On the whole, the in-situ synthetic terrazzo systems achieve a better skirting, although they are sometimes let down on appearance and smoothness.

Anti-static performance
Although the electrical performance of theatre flooring has not been the subject of these researches, all samples were required to conform to the electrical standards required for theatres, before any testing was undertaken.

The electrical requirements for operating theatres are contained in HTM2.

Specifiers should make certain that they adequately cover these requirements in their specifications as it is not sufficient to refer only to a 'conductive' or 'anti-static' requirement.

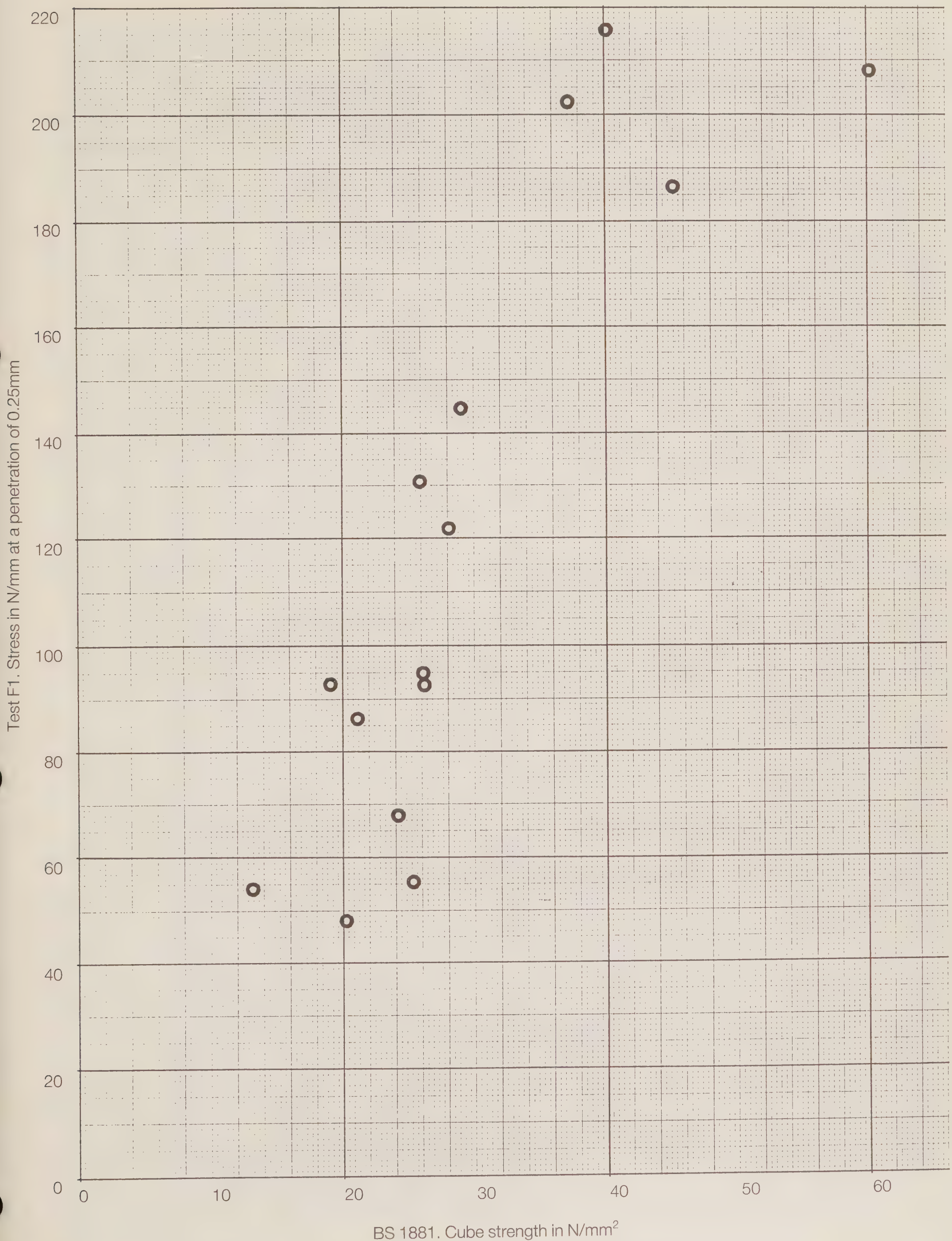
Some materials manufactured overseas, in North America for instance, may conform locally to anti-static requirements, (ie NFPA Bulletin 56A), but fail to conform to HTM2.

Investigation into bearing strengths of floor screeds
December 1982

Scatter diagram plotting the mean cube test results against Test F1 results.

Cube tests: in accordance with BS 1881.

Test F1: Stress at 0.25mm penetration from continuously loaded 10mm dia steel mandrel, rate not exceeding 12N/mm²/min.



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Scatter diagram plotting the mean BRE test results against Test F1 results.

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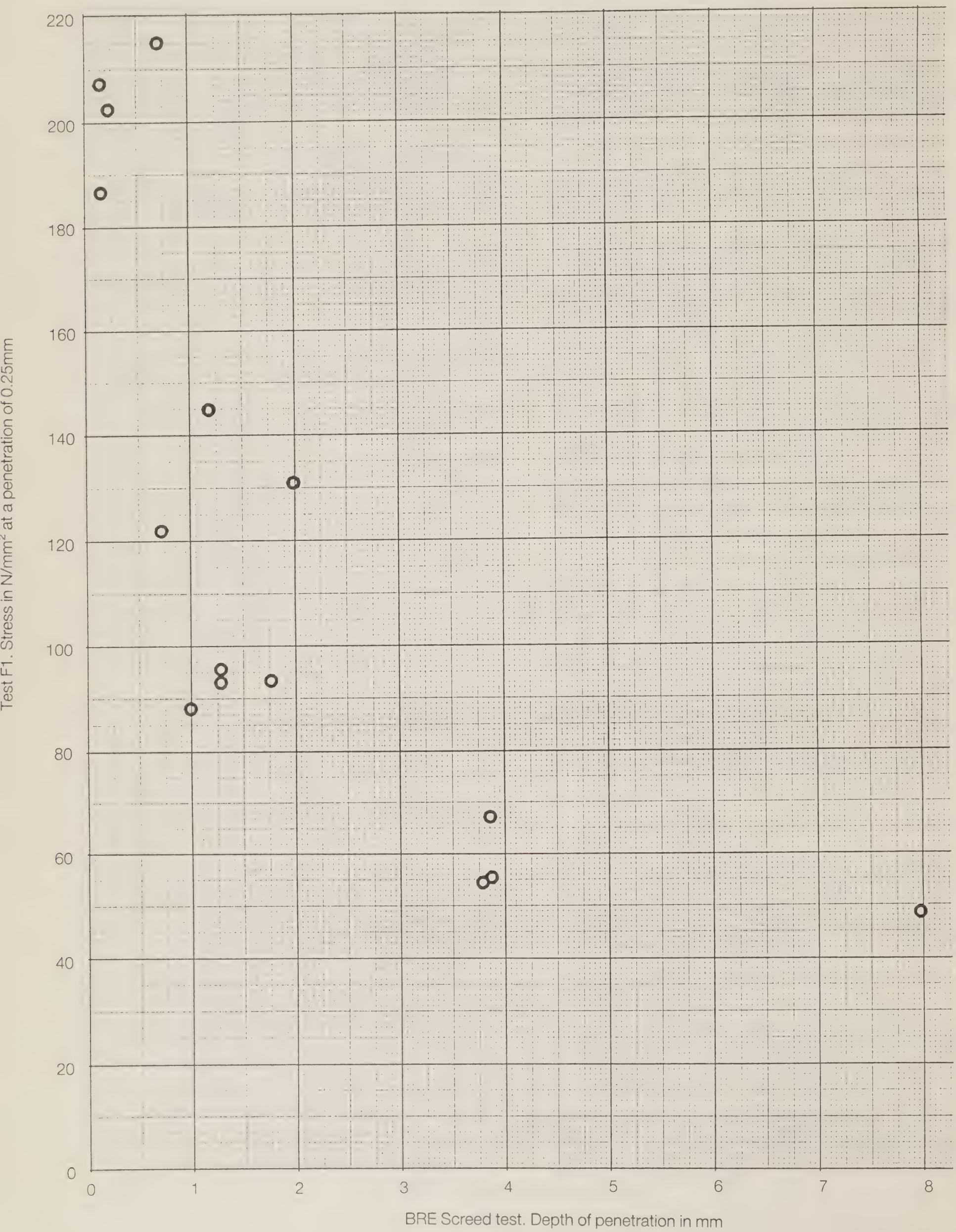
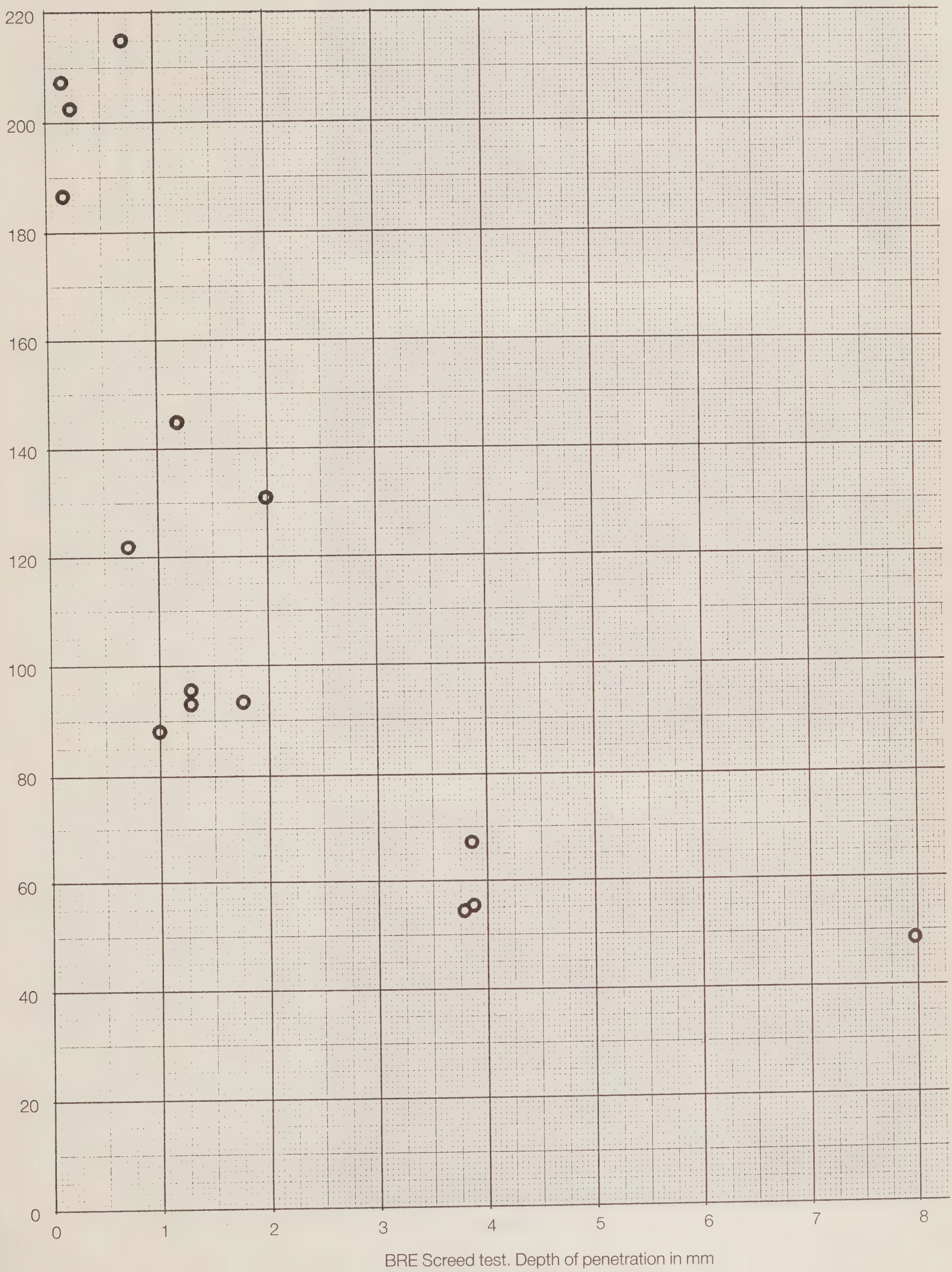


Investigation into bearing strengths of floor screeds
December 1982

Scatter diagram plotting the mean BRE test results against Test F1 results.

Test F1: Stress at 0.25mm penetration from continuously loaded 10mm dia steel mandrel, rate not exceeding 12N/mm²/min.



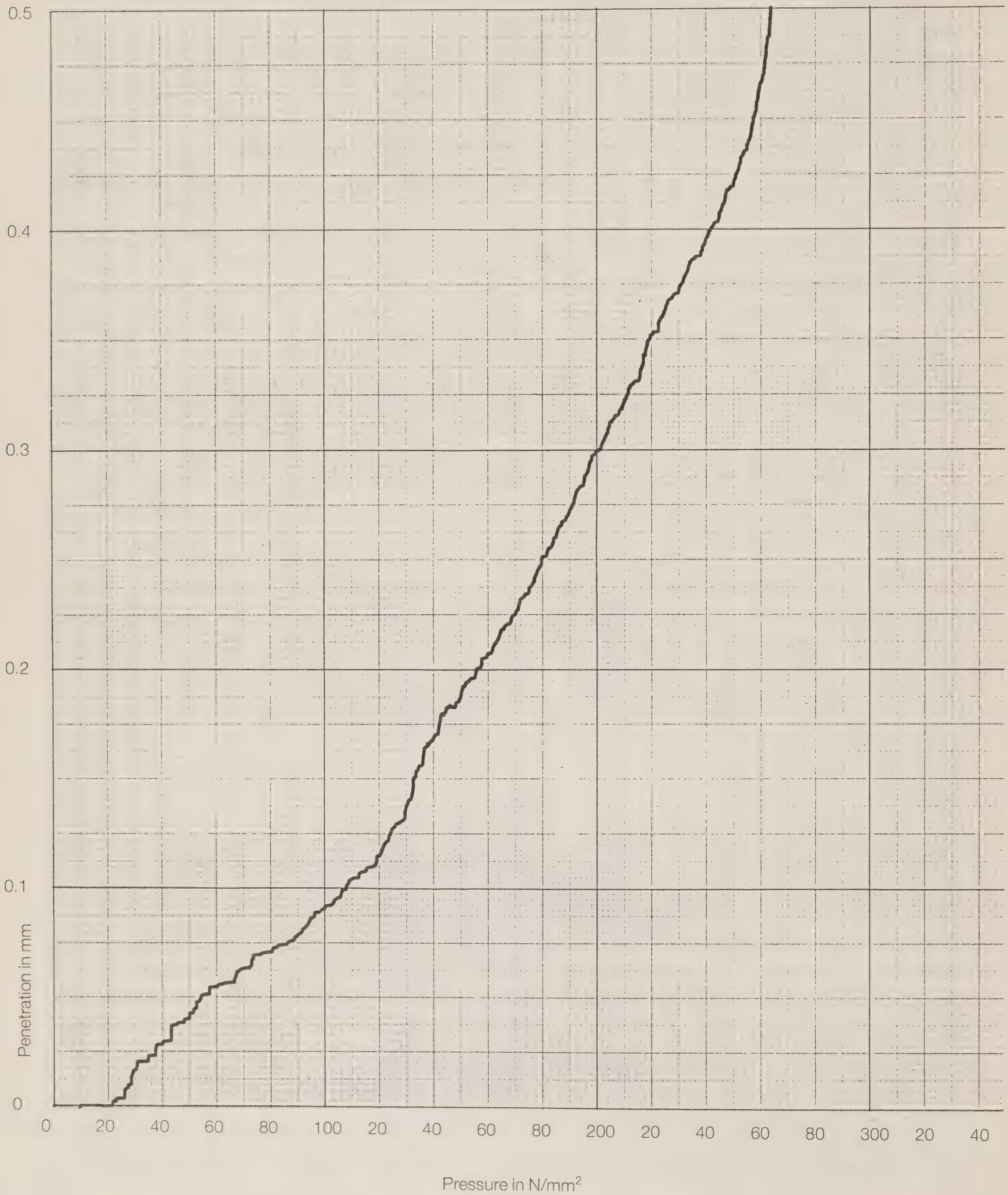
Investigation into bearing strengths of floor screeds
August 1982

Test F1
Static compressive bearing strength.

Graph of pressure/penetration tests using a 10 mm dia contact area.

Material: 1:3 cement/sand screed, 40mm x 600mm x 600mm, laid on 50mm precast cement paving slab.

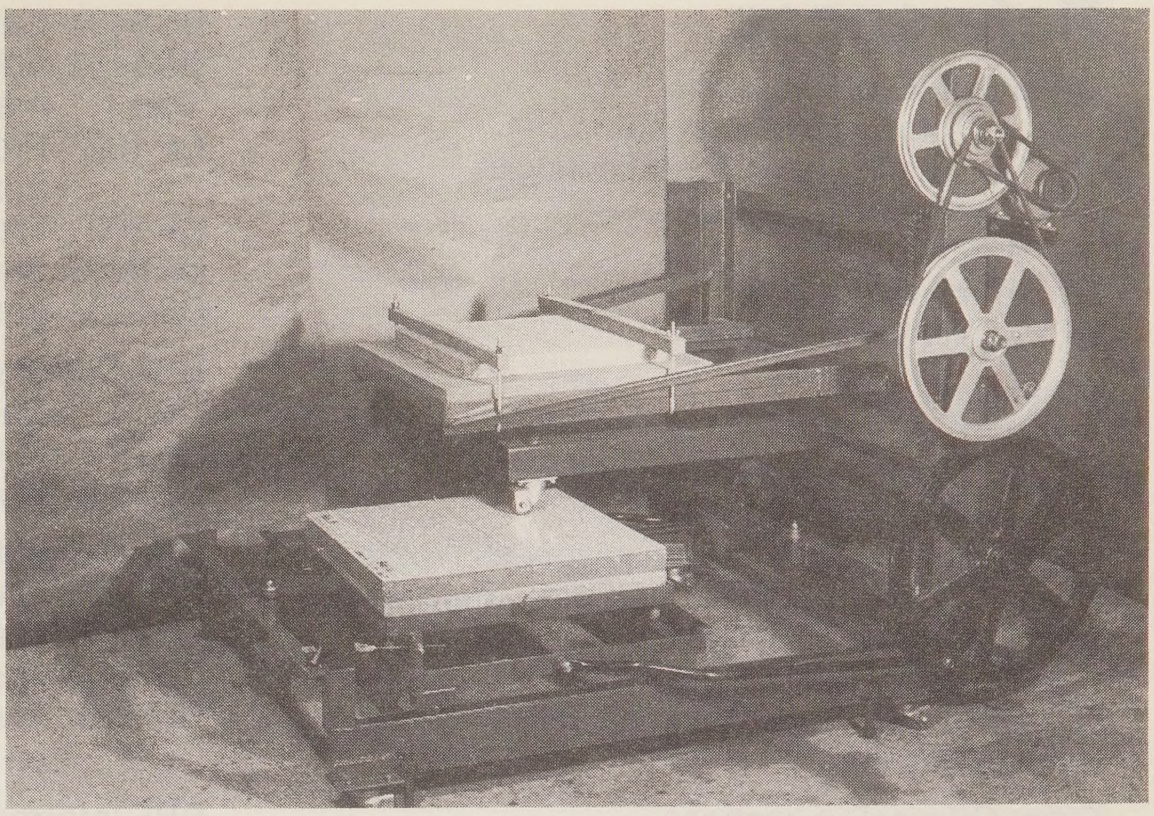
Result of BS 1881 Cube Test: 31.9 N/mm² (mean of 3) 28 days.



Floor trafficking tests

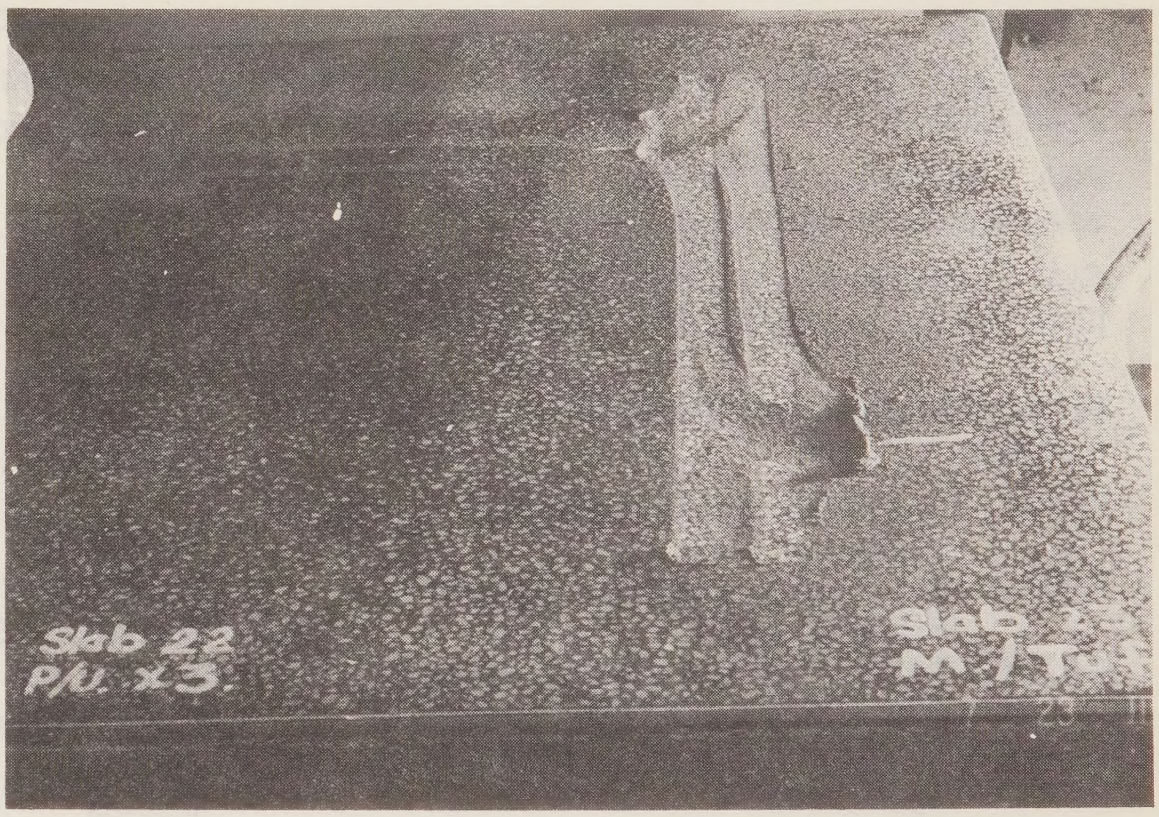
The test machine was constructed as part of the research from which Test method F2 was designed.

This machine simulates conditions where floor surfaces are subjected to the effects of the continuous use of mobile equipment. The machine can be adjusted to suit particular weights of mobile equipment, and can be fitted with a variety of wheels and castors.



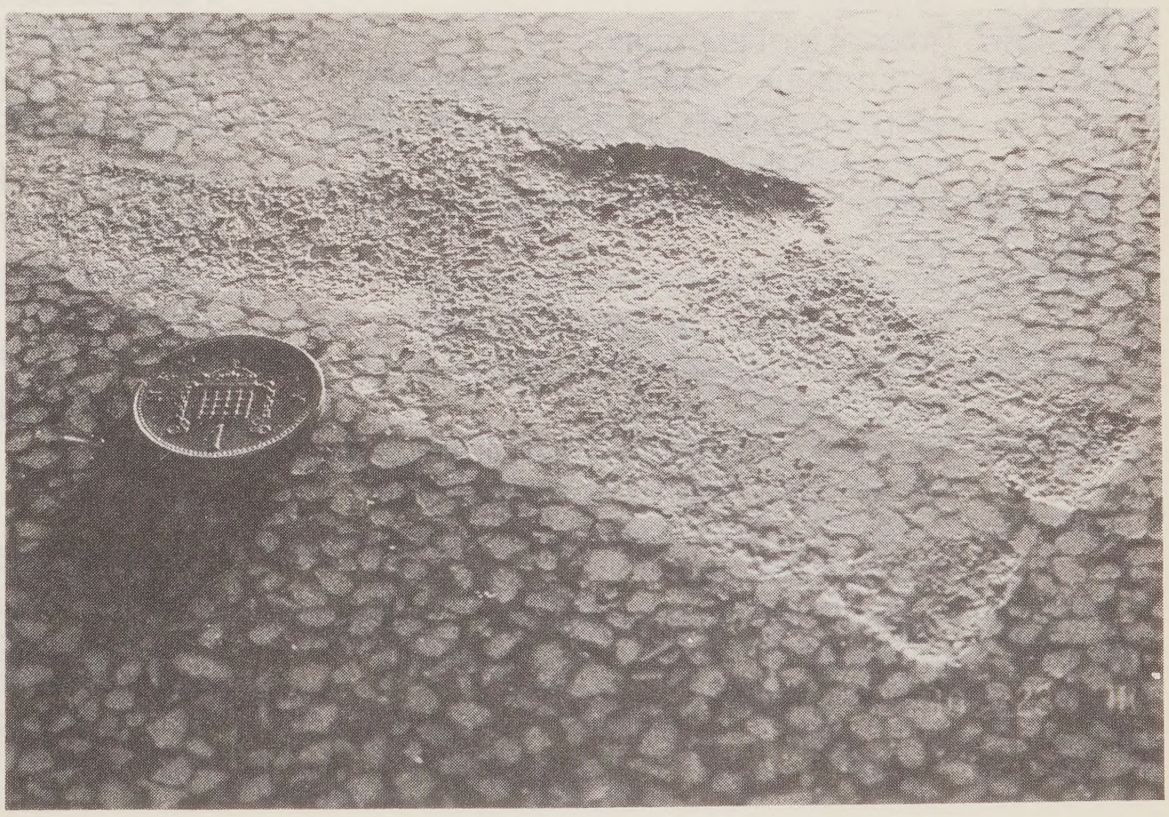
Example of an epoxy resin terrazzo floor, 6mm thick and laid on cement/sand screed, under test on the above machine. The test simulated the conditions of a table weighing 306 kg (including patient) fitted with 50mm diameter castors of phenolic resin.

The test was discontinued at 10 000 cycles, due to the serious degradation of the surface. This is less than half the prescribed number of cycles of the test.



A further photograph taken at 10 000 cycles, during the above test, showing the point of maximum erosion at the position where the twin wheeled castor swivels.

Note also the erosion at the end of the castor run, (right hand side of photograph) where the castor comes to rest, and commences to move.



References

Other HMSO publications
Health Technical Memoranda
2 Anti-static precautions: flooring in anaesthetising areas
56 Partitions
58 Internal doorsets
64 Sanitary assemblies

Other DoH data
Activity data base
Hospital Equipment Information No. 90
Item 22/81: friction burns
Health Building Note 6: Radiodiagnostic rooms
Health Notice (78)32: Furniture Purchasing Advisory Group: Soft floor coverings
DoH Domestic Management Manual
Health Building Note: Common activity spaces
Nucleus data packs

Other Official Publications
National Building Studies – Research Paper No 32 - The forces applied to the floor by the foot in walking

The Crown Suppliers – Central Call-off Contract arrangements

PSA Method of Building "Performance Specification for platform floors"

GLC Development & Materials Bulletin No 43 (2nd series) - Slip resistance of floor finishes

British Standard Specifications and Codes of Practice

BS 12 Ordinary and rapid-hardening Portland cement
BS 810 Sheet linoleum, cork carpet and linoleum tiles
BS 882 Aggregates from natural sources for concrete (including granolithic)
BS 1076 Mastic asphalt for building (limestone aggregate)
BS 3261: Part 1 Homegeneous flooring; sheet or tile without backing; Type A and Type B
BS 4131 Terrazzo tiles
BS 4357 Precast terrazzo units
BS 4790 Determination of the effects of a small source of ignition on textile flooring (hot metal nut method)
BS 5085: Part 2 Cellular pvc backed flexible pvc flooring
BS 5287 Assessment and labelling of textile floor coverings tested to BS 4790
BS 5325 Code of Practice for the installation of textile floor coverings
BS 5395 Code of Practice for stairs: Table 3 slip resistance of floor and tread finishes
BS 5557 Textile floor coverings: classification and terminology
BS 5606 Code of Practice for accuracy in building
BS 5808 Specification for underlays for textile floor coverings
BS 6431 Ceramic floor and wall tiles
BS 5442 Part 1 Adhesives for use with flooring materials
CP 102 Protection of buildings against water from the ground
CP 202 Tile and slab flooring
BS 8203 Sheet and tested to BS 4790
BS 8204 In-situ floor finishes

BRE Digests
No 54 Damp proofing solid floors
No 79 Clay tile flooring
No 104 Floor screeds

BRE Current Papers
CP94/74 The rippling of thin flooring over discontinuities in screeds
CP72/78 Testing screeds with an impact tester
CP9/79 The effects of some cleaning materials on pvc flooring

BRE Information Paper
IP11/84 BRE Screed Tester: classification of screeds, sampling and acceptance limits

Trade associations
Cement and Concrete Association Advisory Notes:
No 48023 Floor screeds
No 48024 Terrazzo finishes
No 48034 Concrete ground floors: their design construction and finish
No 48035 Parts 1 and 2: Concrete ground floor construction
No 48040 High strength concrete topping for floors including granolithic
No 48046 Laying floor screeds

The National Federation of Terrazzo and Mosaic Specialists: Specification of pre-cast and in-situ terrazzo and mosaic

The National Federation of Plastering Contractors: Guidance note on floor screeds and finishes

British Carpet Classification Scheme

Fibre Bonded Carpet Manufacturers Association Classification Scheme

Mastic Asphalt Council and Employers Federation: Flooring with mastic asphalt.

Contract Flooring Association: Flooring Compendium for Architects and Specifiers

Construction Industry Research and Information Association: Selection of appropriate Floor/Screed/Finish systems (to be published)

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